LIPSedge™ AE430 / 470
Ruggedized 3D Stereo Camera

User's Manual

Dec 2025

Revision 1.2.2

Although every effort has been made to ensure the accuracy of this manual, errors and inconsistencies may remain. The manufacturer assumes no liability resulting from errors or omissions in this manual, even if damages arise from the use of the information. All contents are subject to constant revision to improve its reliability and may be changed without prior notice.

December 2025

LIPS
Sense The World

Contents

Revision History

Revision	Description	Date
1.2.2	Edited images in Pg no 23 and 83 to 90	2025/12/22
1.2.1	1. Change the depthviewer drawing from pages 27 to page 30. 2. Modified the sample naming from pages 83 to 90.	2024/07/30
1.2	Add the Linux x64& Jetson arm64 installation guide in Chapter3 3.1-B & Chapter3 3.1-C.	2024/04/19
1.1	Re-Modified the User Guide Frame	2024/03/08
1.0	New Release	2023/10/24

1. Package & Hardware Overview

1.1 Package Overview

A. Packing List

The packing list serves as a reference for package contents. If anything was missing, contact info@lips-hci.com.

No.	Item	Qty.
1.	LIPSedge™ AE430 / AE470 3D Stereo Camera	1
2.	LIPSedge™ AE430 / AE470 3D Stereo Camera Quick Start Guide	1
3.	M12 to RJ45 cable * 2m	1

B. Camera Accessories

The following supplementary options facilitate the installation process but are NOT included in the package. You need to prepare these accessories on your own.

- Camera tripod: Secures the camera to a stable position.

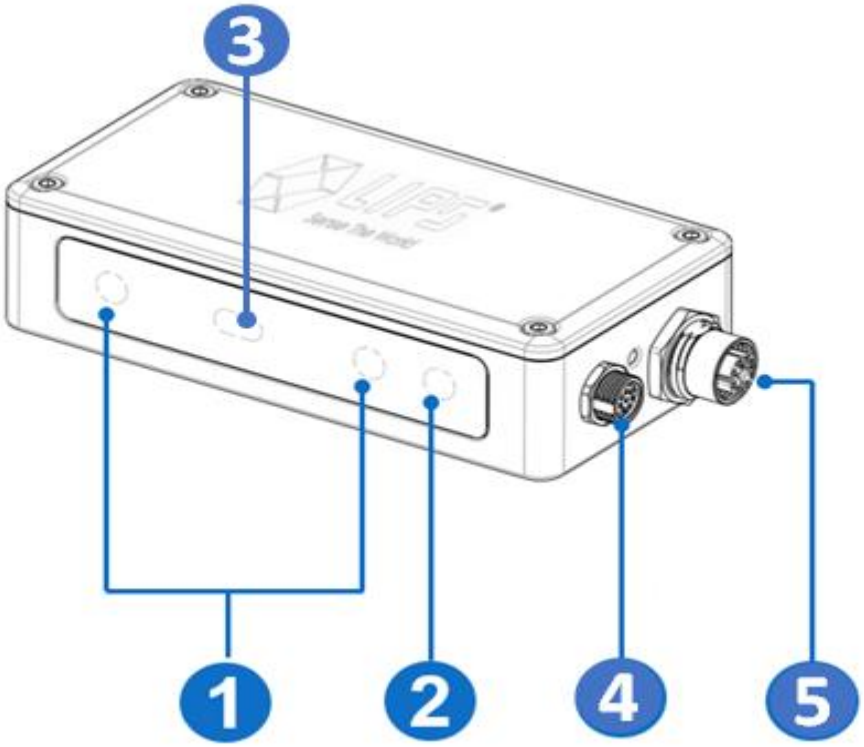
C. Supplementary Options

This section is NOT applicable to this model.

1.2 Hardware Overview

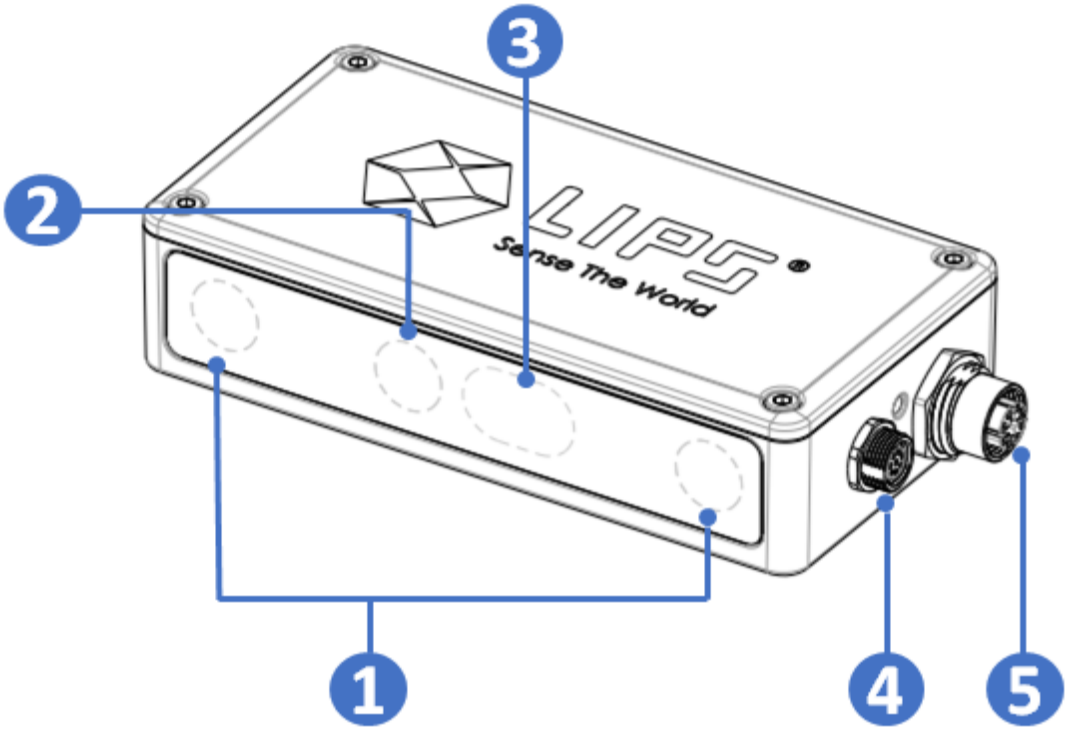
A. Hardware Features

LIPSedge™ AE430



No.	Name	Functions
1.	IR Stereo Sensor	Receives the IR image.
2.	RGB Sensor	Receives the RGB image.
3.	Infrared Projector	Projecting a static infrared pattern.
4.	M8 Connector	Connects to an M8 cable for power input / resets to factory default.
5.	M12 / Ethernet Connector	Connects to a M12 to Ethernet cable for power and data transmission.

LIPSedge™ AE470



No.	Name	Functions
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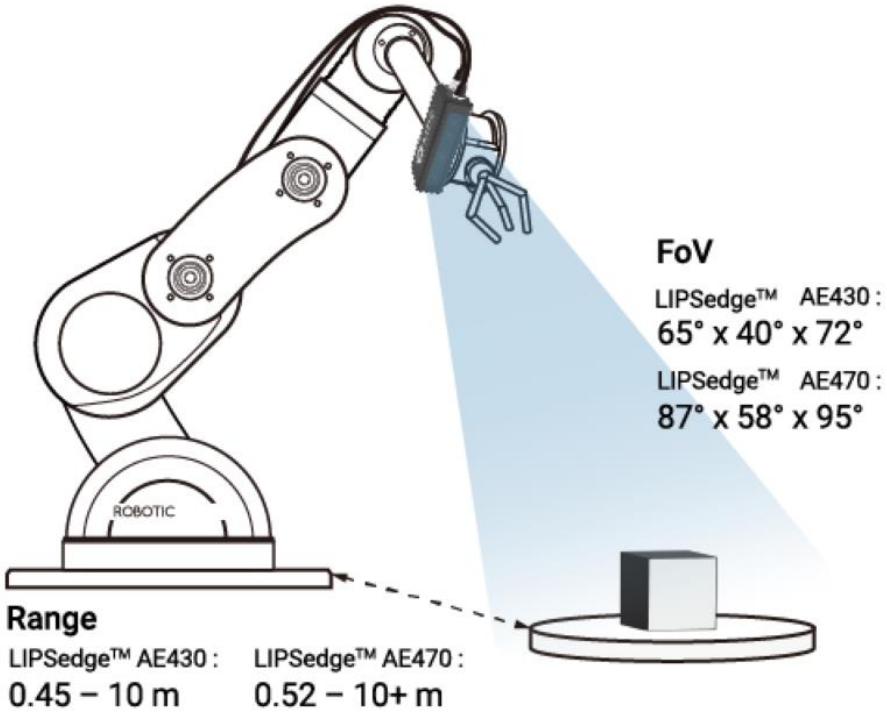
B. Hardware Installation



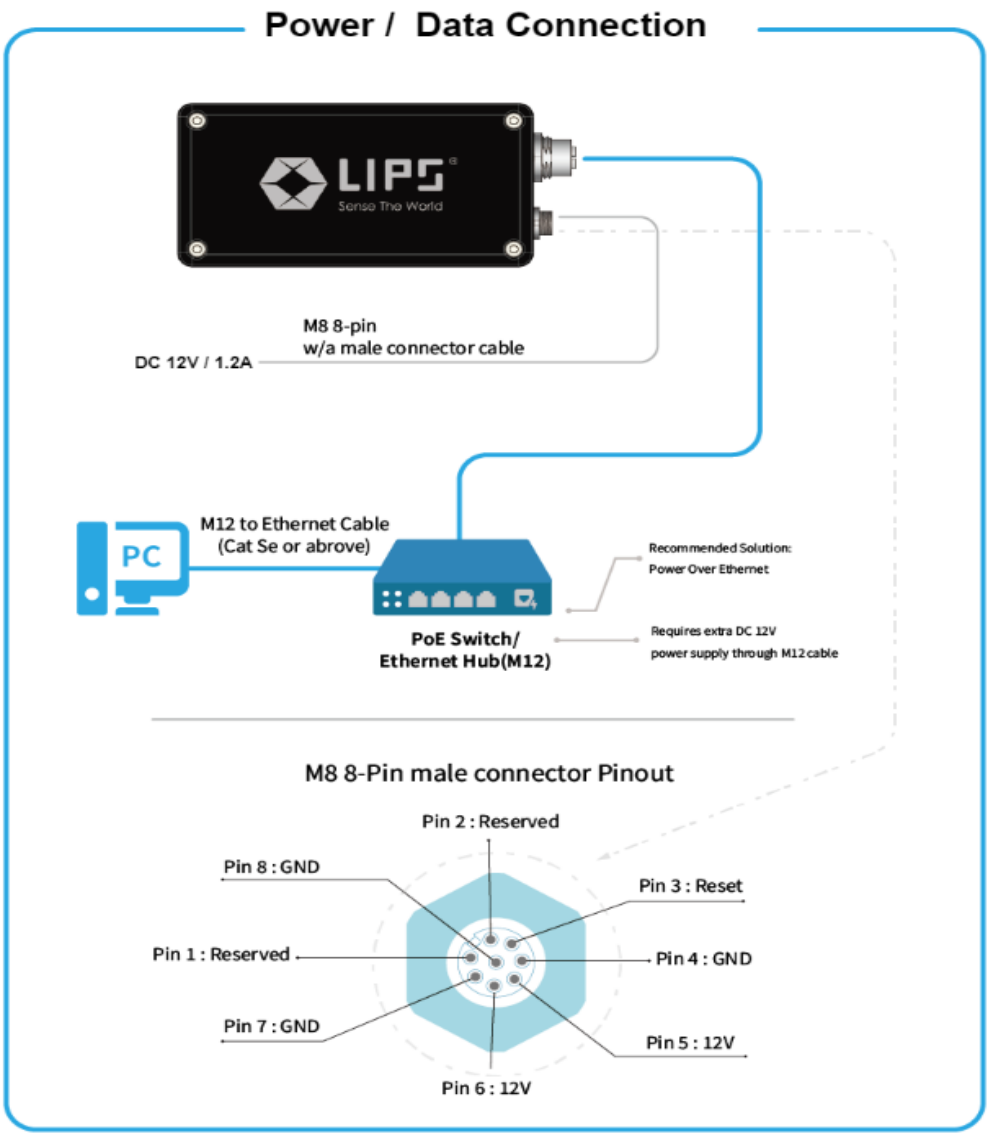
- **Camera working distance**: LIPSedge™ AE430 / AE470 works best within the following range:
  - LIPSedge™ AE430: 0.45 – 10 m
  - LIPSedge™ AE470: 0.52 – 10+ m

  Keep the target within the optimal range or the scanning performance may decrease.
- **Camera position**: Install the camera to a stable platform, facing the target. Note that LIPS Corp. does NOT provide a tripod within the package, and you need to get your own tripod for hardware installation.
- **Illumination**: AVOID installing the camera at places under direct sunlight or complete darkness.

C. Camera Connection

LIPSedge™ AE430 / AE470 has two power supply channels: an M12 or M8 interface. M12 is recommended as the standard scenario. An M12 cable can optionally separate the power supply/data transmission channel.

WARNING: When shipped, a thin film layer is applied to the camera lens for protection. Remove the film ONLY when you are ready to use the camera. Keeping the thin film while streaming may decrease the image quality.

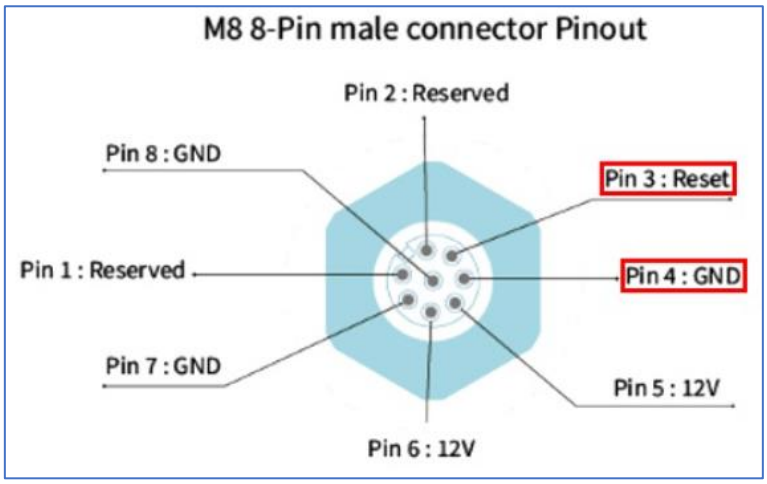


Power M8 A-Code Male connector

Pin no.	Description
1	Reserve
2	Reserve
3	Ethernet Reset
4	GND
5	DC 12V Power supply
6	DC 12V Power supply
7	GND
8	GND

[Hardware reset]

A factory reset erases all customized configurations and returns the camera to its original default settings. Adjusting camera settings results in irreversible issues, so a factory reset can be performed by simultaneously shorting **Pin 3 (Reset)** and **Pin 4 (Ground)** in the M8 interface.



1. Insert a pin into **the camera's Pin 3 (Reset) and Pin 4 (Ground)** and **hold** 30 seconds.

Note: It is essential to maintain the pin/camera connection for the full 30 seconds to allow the camera's reset process to complete. If the pin was released prematurely, the reset may not be successful.

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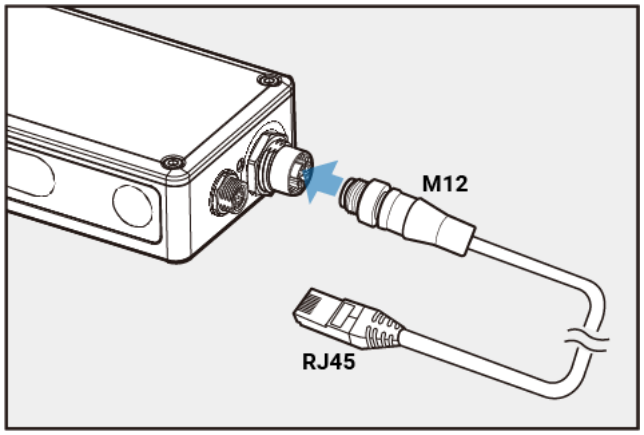
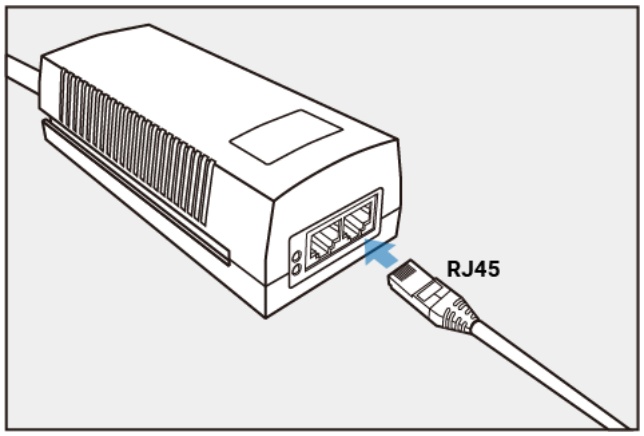
2. Replug the camera. The camera is restored to its default settings.

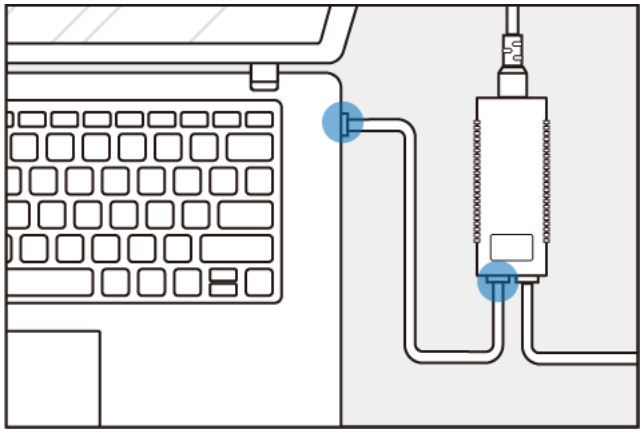
3. Connect the **M12 end** of the **M12 to RJ45 cable** to the camera's **M12 connector**.



4. Connect **the RJ45 end** of the **M12 to RJ45 cable** to the **Power / Data Output port** of a **PoE Switch**.



5. Connect the **Data Input Port** of the PoE Switch with **the host PC / laptop**.



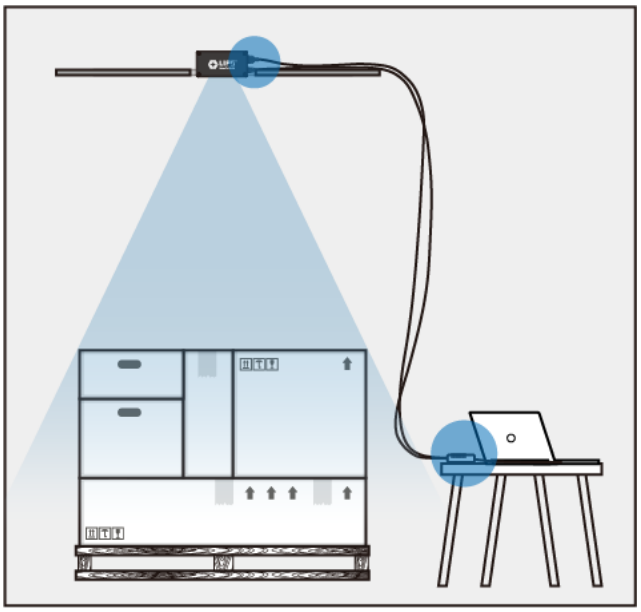
D. Mounting Options

LIPSedge™ AE430 / AE470 supports an **overhead mount**.

1. Find an installation location on your ceiling and drill a hole.

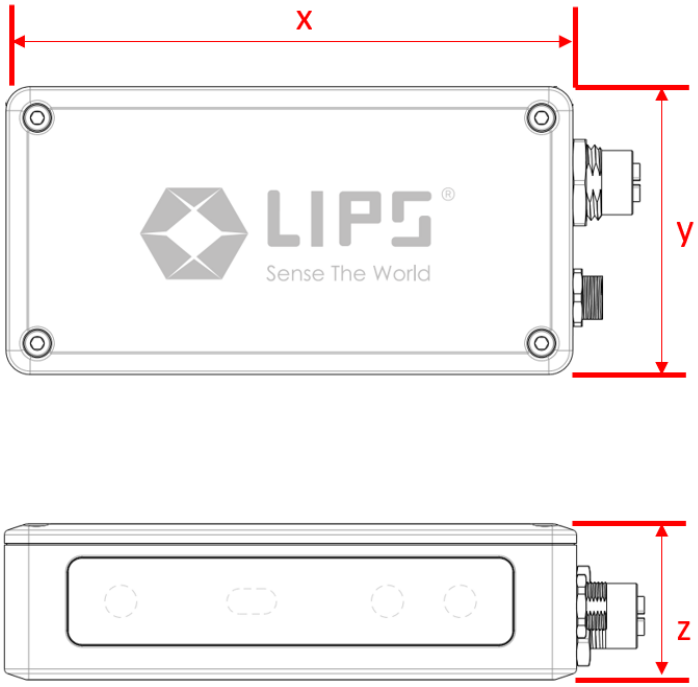
2. Use a camera holder to secure the camera to the installation location.

3. To connect the camera to your PC or laptop through the PoE Switch, refer to the installation process in *Chapter1 1.2-C*.



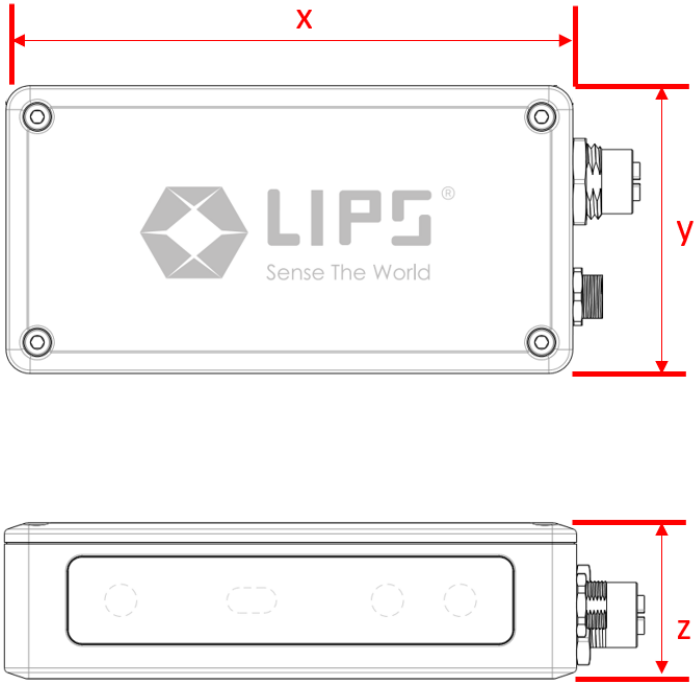
E. Hardware Dimensions

LIPSedge™ AE430



Dimension	MIN	NOM	MAX	TOLERANCE	UNIT
X	117.5	118	118.5	±0.5	mm
Y	59.5	60	60.5	±0.5	mm
Z	31.5	32	32.5	±0.5	mm

LIPSedge™ AE470



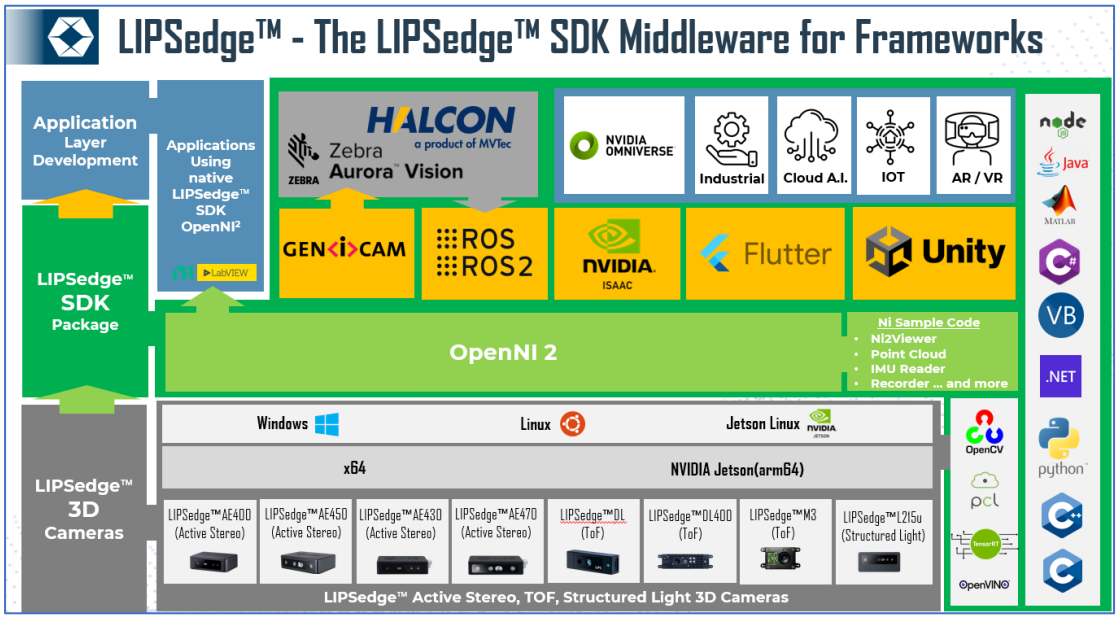
Dimension	MIN	NOM	MAX	TOLERANCE	UNIT
X	129.5	130	130.5	±0.5	mm
Y	65.5	66	66.5	±0.5	mm
Z	31.5	32	32.5	±0.5	mm

2. SDK Structure

LIPS 3D camera / SDK offers a system for developing depth-sensing applications. As the LIPS system architecture illustrates, the system comprises the hardware and software layers.

The hardware layer oversees data capture, transfer, and processes.

In the software layer, the captured data is fetched by the LIPS SDK (Software Development Kit) on the OS environment. Depending on the project's complexity, wrappers, and third-party utilities may be engaged before the data is eventually presented in the application layer for business applications.



The core of the system, the LIPS SDK, is comparable to a toolbox full of software modules comprised of middleware, libraries, wrappers and API, and miscellaneous programming languages/platforms for application development. With extensive wrapper support, LIPS SDK enables developers to access bottom-layer data with APIs, thus eliminating the hassle of changing third-party functions. The result is a highly effective project scoping, monitoring, and execution workflow compatible with the fast-paced AIoT market and machine vision demands.

3. SDK Installation

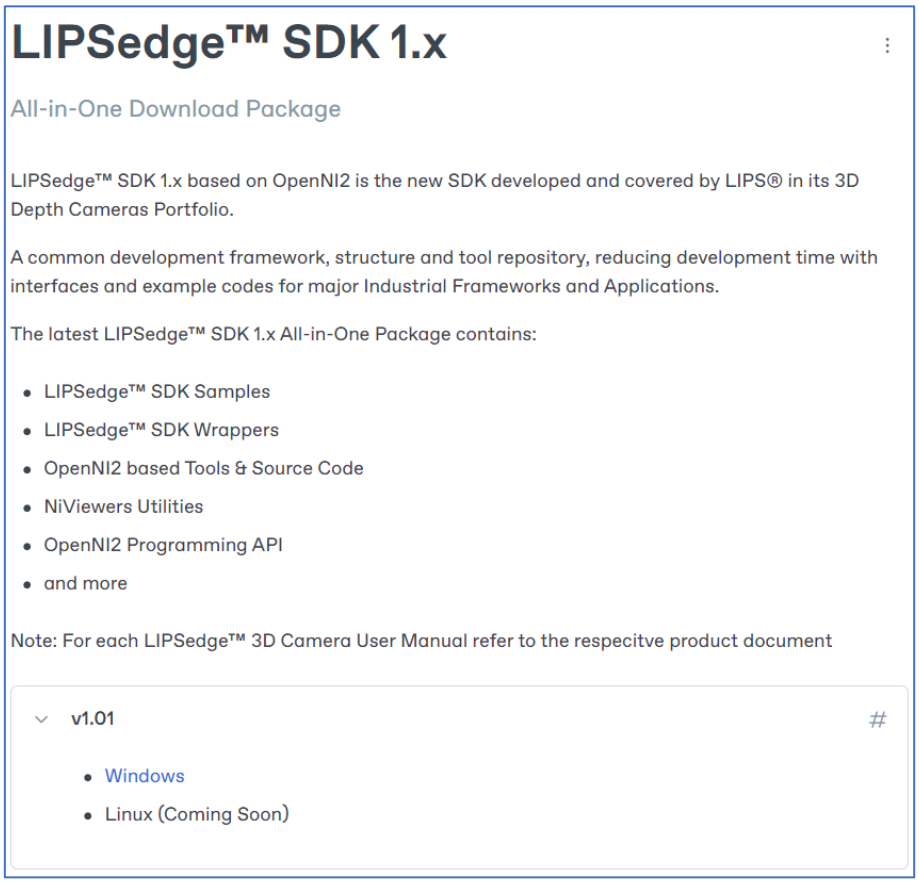
3.1 Platforms

A. Windows Installation (x64)

a. SDK Installation

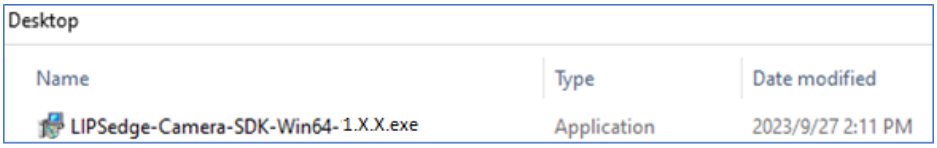
To access the SDK, visit [3D Depth Camera SDK Free Download | LIPSedge™ SDK (lips-hci.com)](#) and procure the package for the preferred version, framework, and compatible operating system.

1. Visit [LIPSedge™ SDK](#) website.



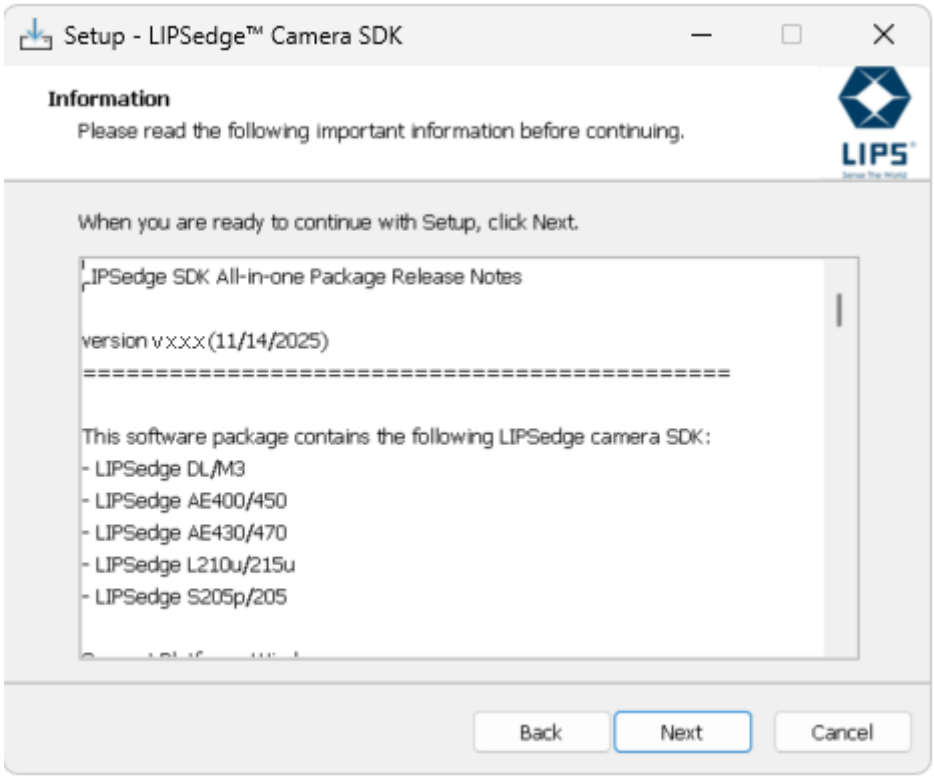
2. Under **LIPSedge™ Camera SDK**, select SDK file to download the installation file based on the preferred version, framework, and compatible operating system.

3. Extract and execute the downloaded file.

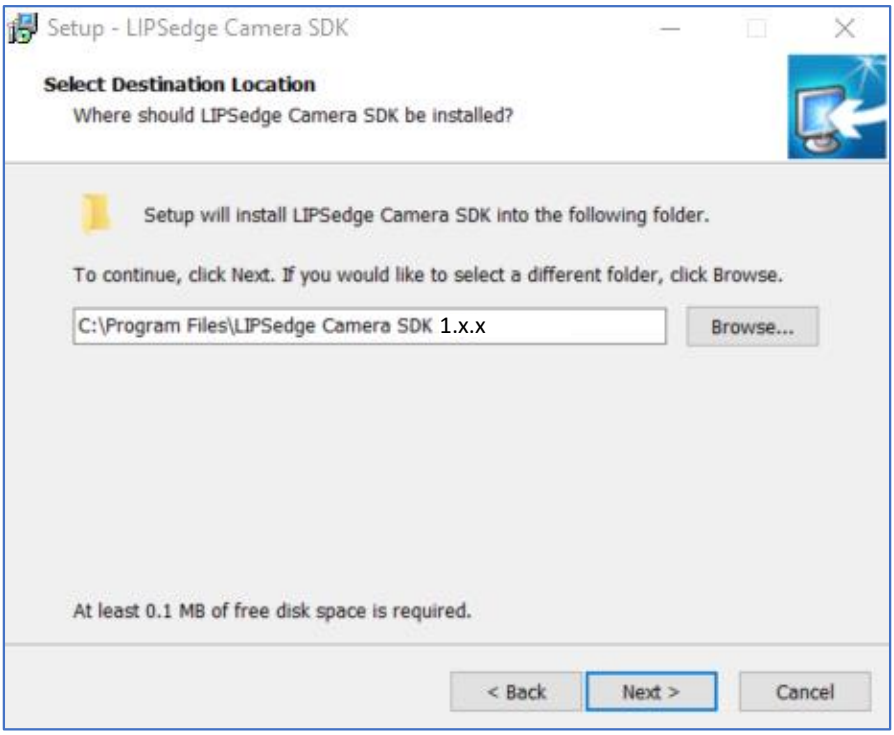


4. Click **Next**.

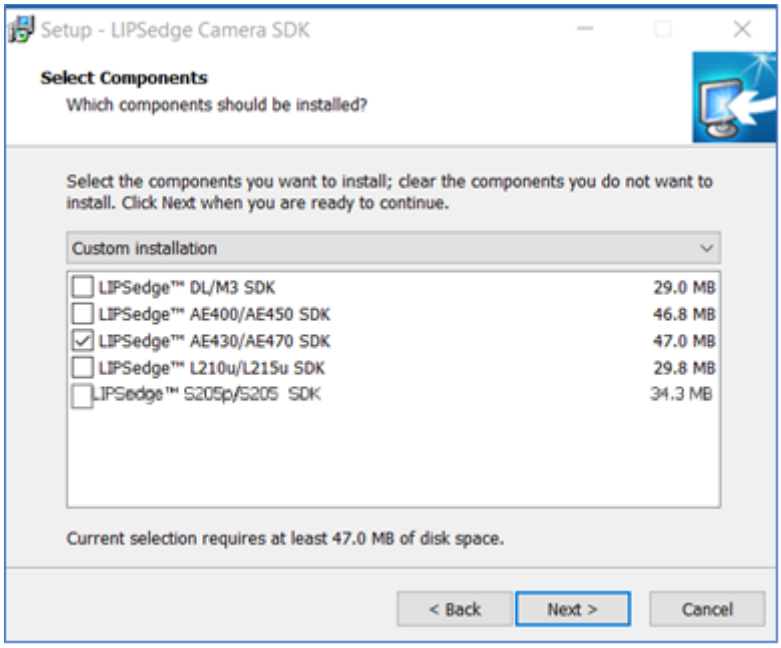
5. Click **Next**.



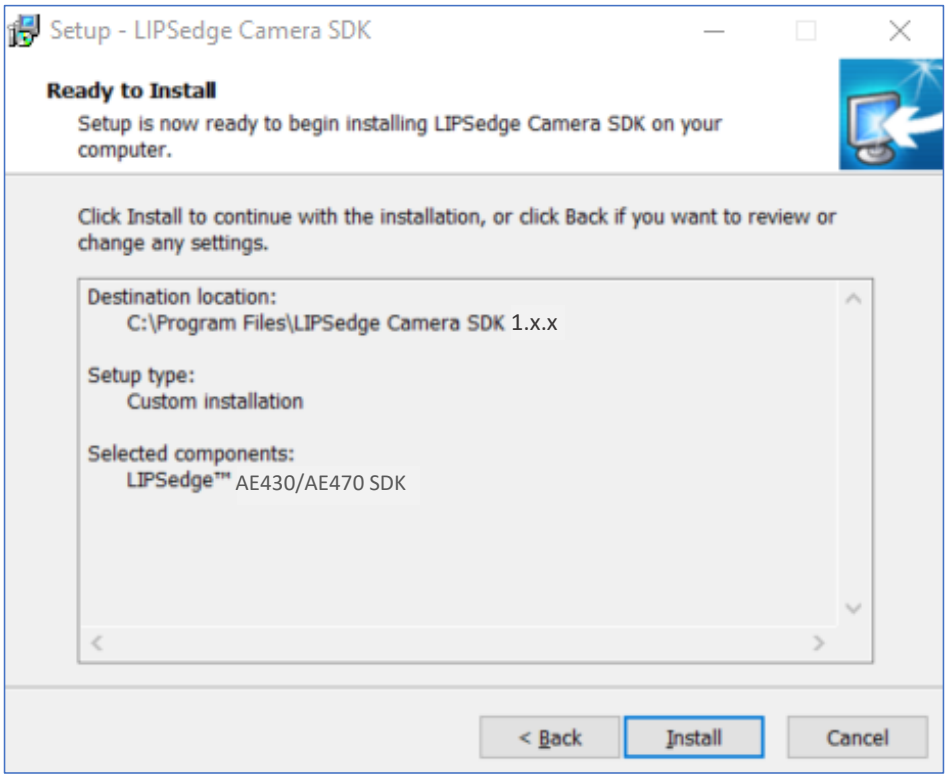
6. Select **the SDK installation location** and click **Next**.



7. From the top menu, select the type of installation for the host PC: In this case, selecting Custom Installation > LIPSedge™ AE430 / AE470 SDK is recommended.
   - **Full Installation**: Install all LIPSedge™ SDKs with all system dependencies for all available LIPSedge™ camera models.
   - **Compact Installations**: Install LIPSedge™ SDK with minimum system dependencies for the chosen model.
   - **Custom Installation**: Install LIPSedge™ SDK with limited functionality for the chosen model.

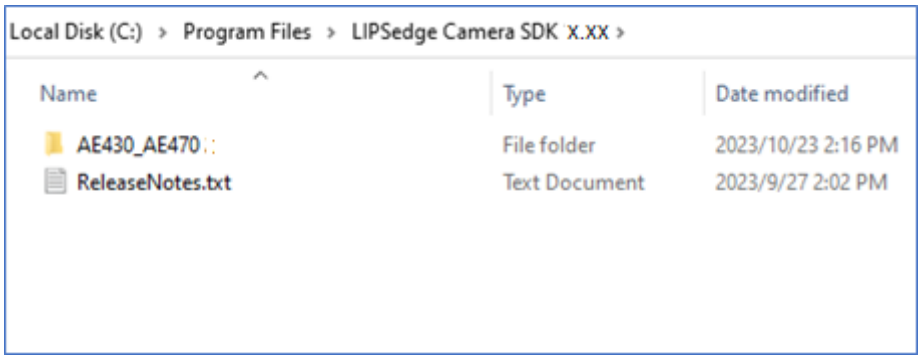


8. Click **Install**.



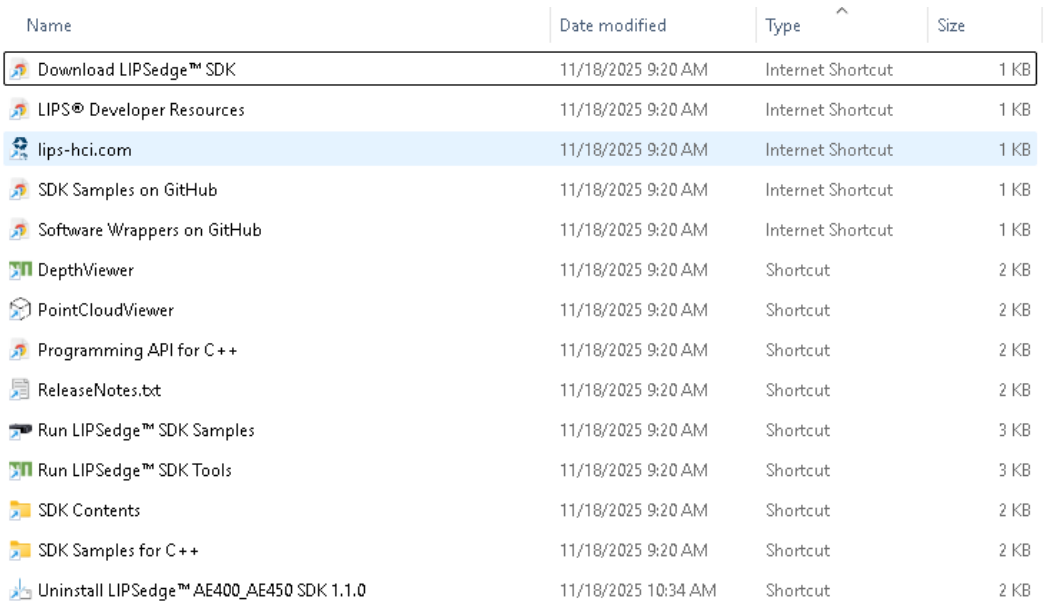
9. Click **Finish**.

10. Once the installation is successful, the LIPSedge™ SDK and its relevant components are accessible at C:\Program Files\LIPSedge Camera SDK x.xx.



11. The LIPSedge™ SDK is also accessible from the desktop shortcut.

12. The desktop shortcut folder contains:
    - **Browse LIPSedge SDK Samples**: A ink to LIPS Corp.'s GitHub for example applications
    - **Browse LIPSedge SDK Wrappers**: Link to LIPS Corp.'s GitHub for the supported wrapper's source code.
    - **Download Latest SDK**: Link to LIPS Corp's official website for the latest SDK
    - **LIPS tools source code**: Contains a series of executable tools and the source code of these tools.
    - **lips-hci.com**: Link to LIPS Corp's official website.
    - **PointCloudViewer-gl**: A 3D point cloud visualizer through OpenGL.
    - **DepthViewer**: An image viewer for streaming RGB / depth images. Refer to *Chapter3 3.1-A-c*.
    - **OpenNI2 Programming API**: A link to OpenNI API's programming guide.
    - **Release Notes**: Announcement of the latest feature.
    - **Run LIPS tools**: Contains a series of executable tools.
    - **Uninstall LIPSedge™ SDK**: A quick uninstallation link for LIPSedge™ SDK.



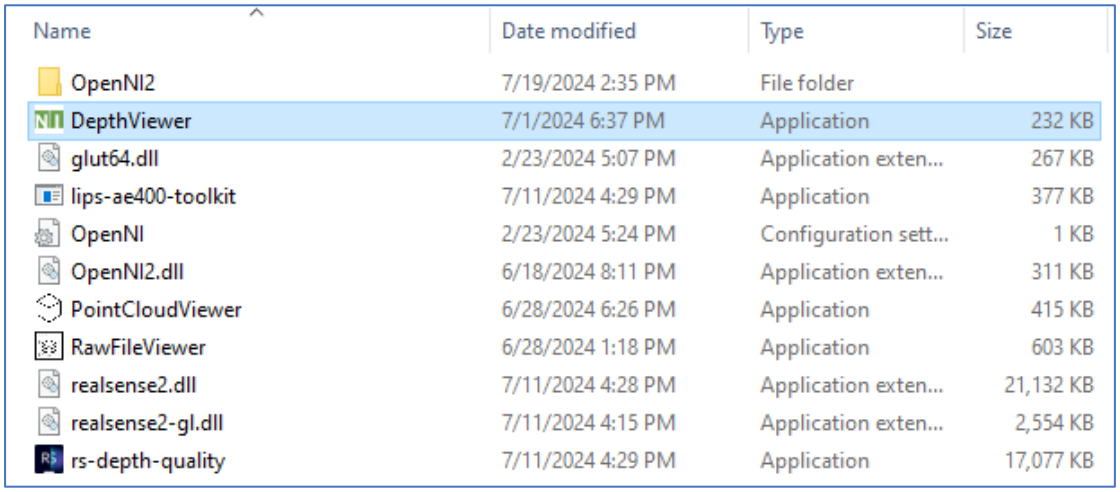
Name	Date modified	Type	Size
Download LIPSedge™ SDK	11/18/2025 9:20 AM	Internet Shortcut	1 KB
LIPS® Developer Resources	11/18/2025 9:20 AM	Internet Shortcut	1 KB
lips-hci.com	11/18/2025 9:20 AM	Internet Shortcut	1 KB
SDK Samples on GitHub	11/18/2025 9:20 AM	Internet Shortcut	1 KB
Software Wrappers on GitHub	11/18/2025 9:20 AM	Internet Shortcut	1 KB
DepthViewer	11/18/2025 9:20 AM	Shortcut	2 KB
PointCloudViewer	11/18/2025 9:20 AM	Shortcut	2 KB
Programming API for C++	11/18/2025 9:20 AM	Shortcut	2 KB
ReleaseNotes.txt	11/18/2025 9:20 AM	Shortcut	2 KB
Run LIPSedge™ SDK Samples	11/18/2025 9:20 AM	Shortcut	3 KB
Run LIPSedge™ SDK Tools	11/18/2025 9:20 AM	Shortcut	3 KB
SDK Contents	11/18/2025 9:20 AM	Shortcut	2 KB
SDK Samples for C++	11/18/2025 9:20 AM	Shortcut	2 KB
Uninstall LIPSedge™ AE400_AE450 SDK 1.1.0	11/18/2025 10:34 AM	Shortcut	2 KB

b. Camera Access

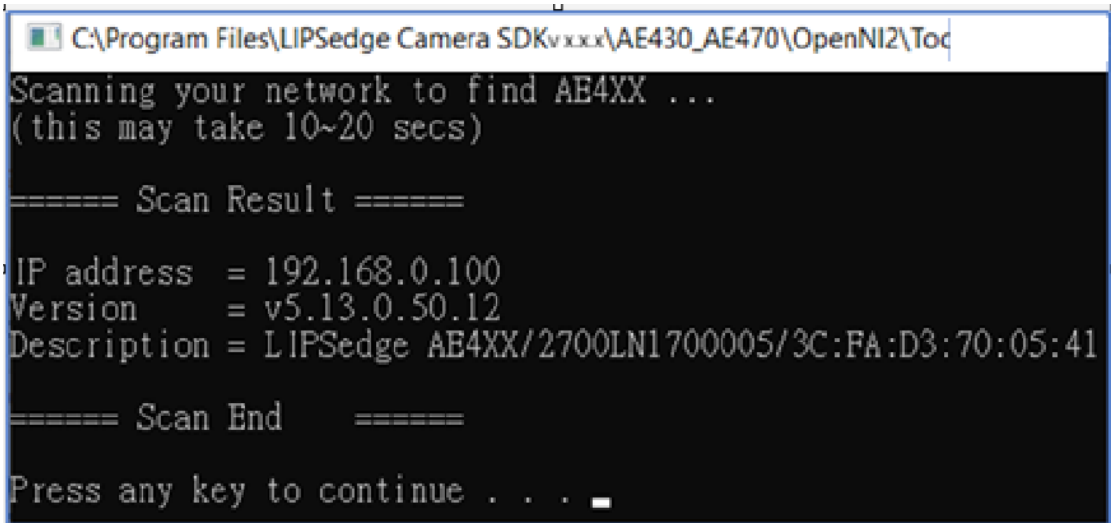
The LIPSedge™ AE430 / AE470 SDK (OpenNI-based) enables the LIPSedge™ AE430 / AE470 camera to stream live 3D, RGB, and point-cloud images efficiently. The SDK supports a single stream. To ensure a seamless visualization experience, follow the instructions for configuring the camera's IP settings before streaming.

Follow the instructions below to access the camera image.

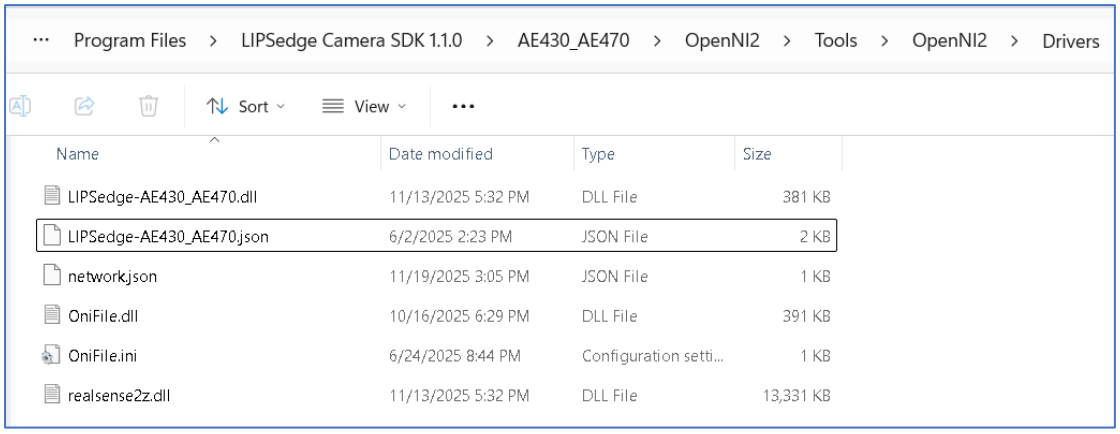
1. Go to **LIPSedge™ AE430_AE470 SDK> OpenNI2 > Tools** and click **lips-ae400-toolkit.**



2. Wait for the toolkit to search for available cameras in the subnet.



3. If the device IP changes, find **network.json** in **LIPSedge™ AE430_AE470 SDK\OpenNI2\Tools\OpenNI2\Drivers**



Note:

1. LIPSedge™ AE430 / AE470 is assigned with a default IP address of **192.168.0.100**. Ensure the host PC / laptop is under the same subnet as the camera for the camera connection.
2. On rare occasions, the application may not be able to detect the camera when a new camera is connected. In that case, **unplug the network cable and restart** the host PC / laptop, and scan again.

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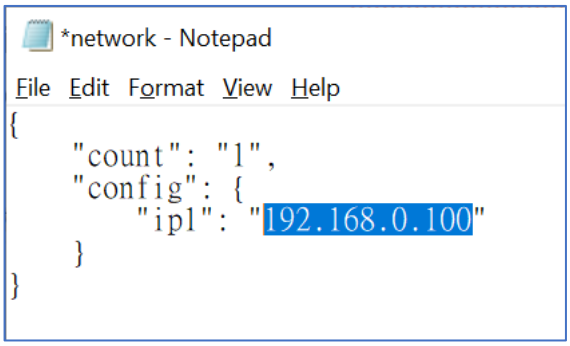
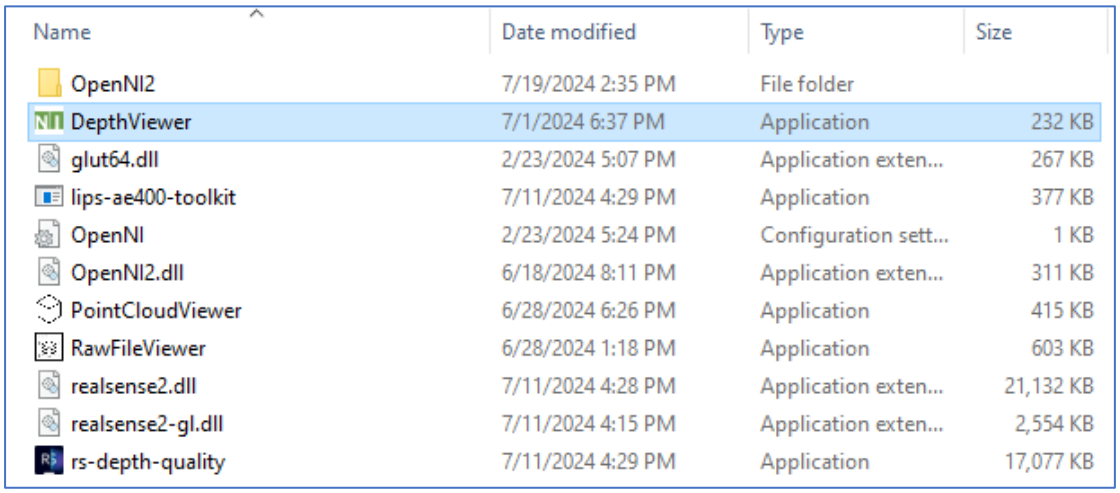
4. Edit **network.json** to modify the camera's IP address (IP1) to match the camera intended for connection.

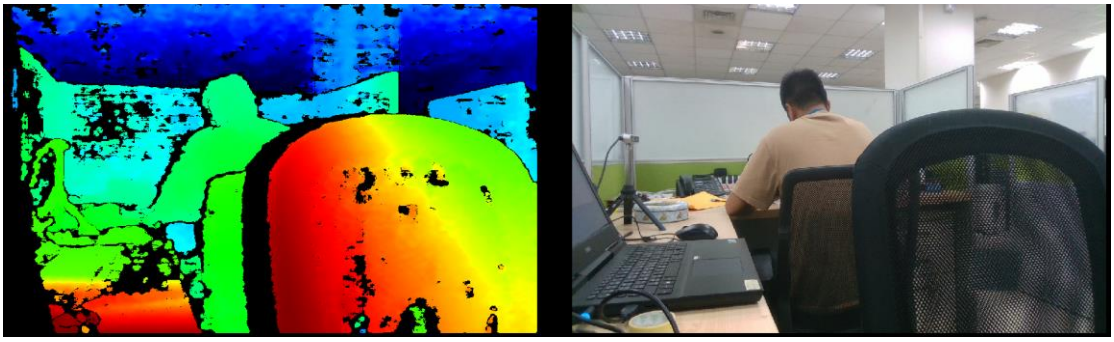


5. Save the modified information.

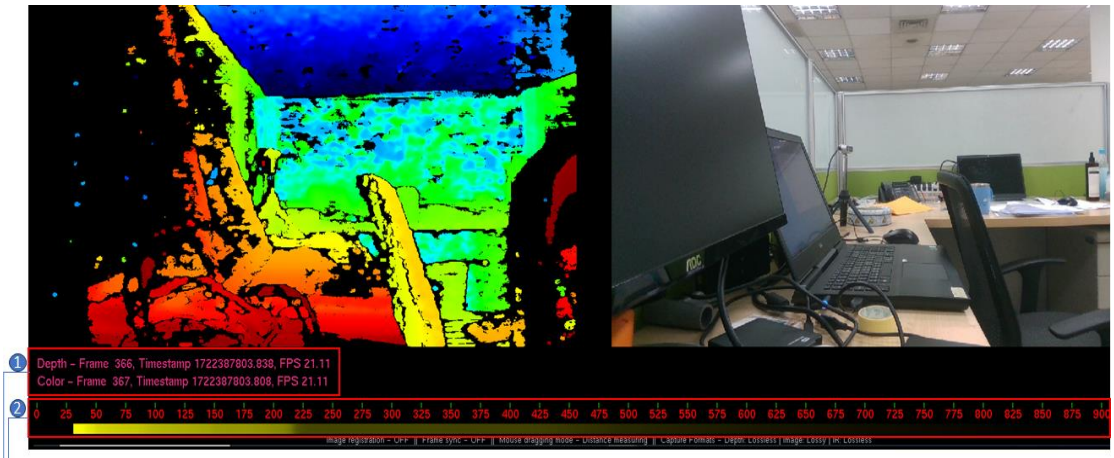
6. Go to **LIPSedge™ AE430_AE470 SDK > OpenNI2 > Tools** and start **DepthViewer**.



7. DepthViewer will display 3D / RGB images once the camera is properly connected.



Press **[p]** to activate **the pointer mode**. The meter below shows the depth data of the given point marked by the indicator.

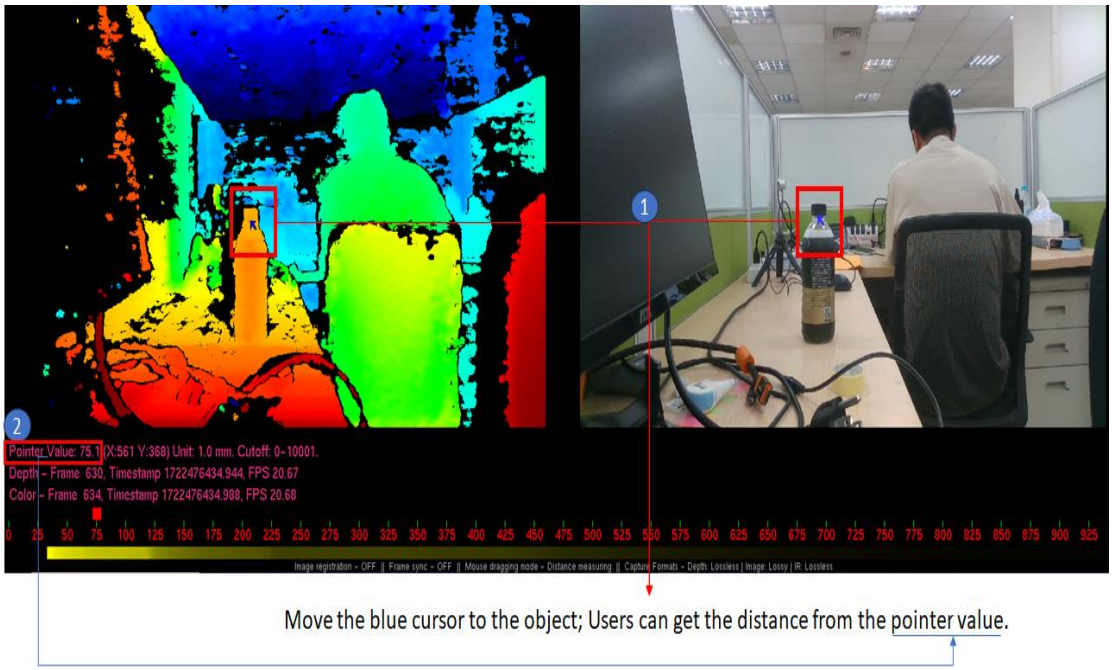


Information includes Depth & RGB: Frame/ TimeStamp/ FPS

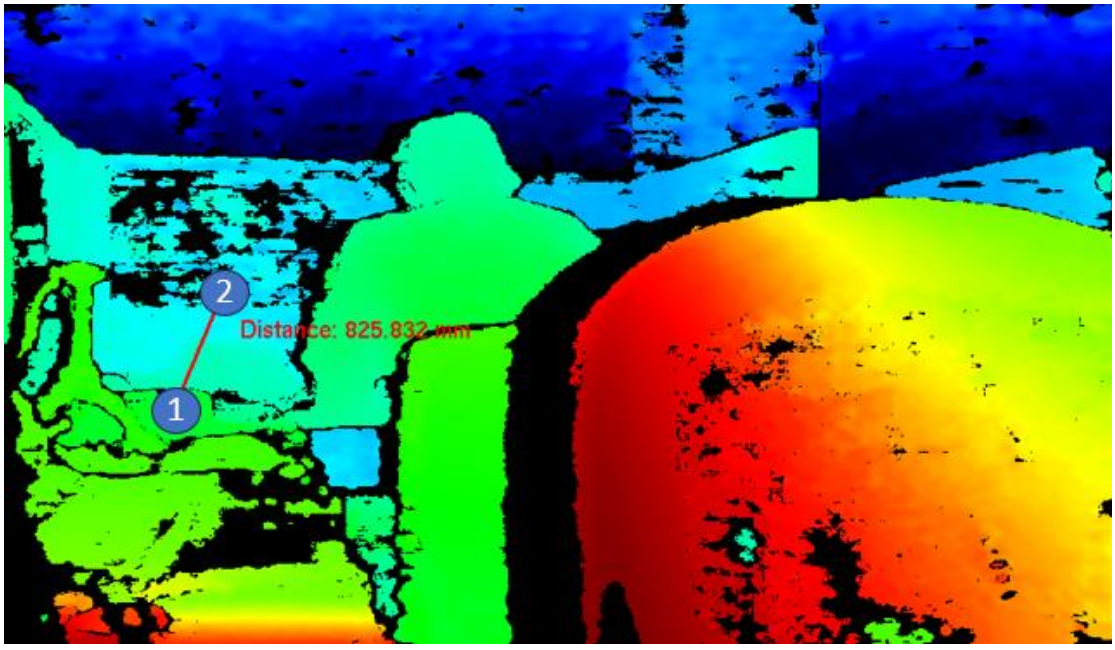
The scale means distance: Size is from 0 to 950mm
- The yellow bar represents the distance range from all objects in the depth viewer.
- The deep yellow bar represents the distance that includes many objects.
- The slight yellow bar represents the distance that includes fewer objects.

Example:
The above scene shows the object's distance from 25mm to 575mm, which 25mm to 225mm include many objects, from 225 to 575mm shows fewer objects.

8. Users can get the depth value by Moving the blue cursor to the object.



9. If users want to measure the distance between 2 points, please drag a mouse cursor from point 1 to point 2, as below. (The distance line will disappear when points move to the black area.)



10. Optionally press F to maximize/minimize the viewer's window.

Note: If the Ethernet cable is forcibly removed while the DepthViewer is functioning, an ERROR! The device disconnected message appears on the screen. To resume live streaming, re-plug the Ethernet cable and restart the DepthViewer.

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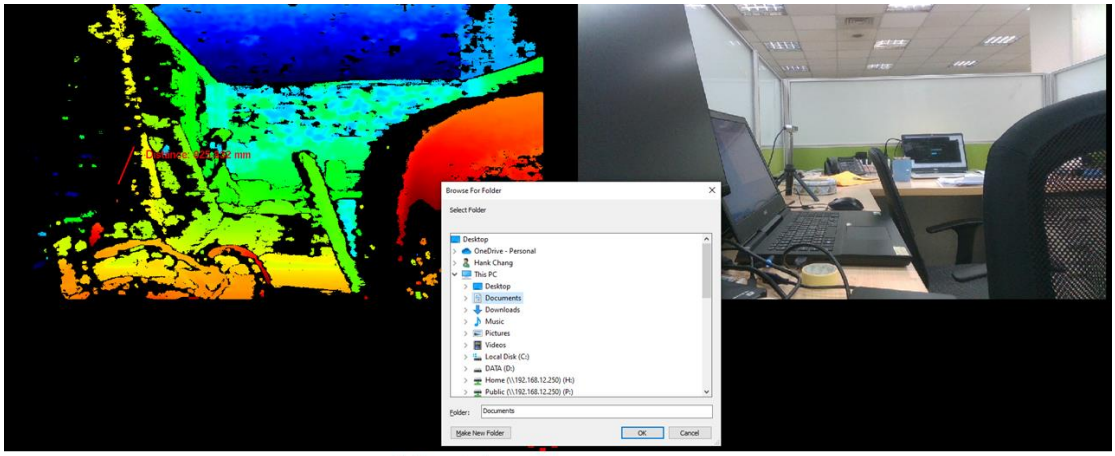
11. Press C to capture the current screen as a raw file. To access the raw file, go to **LIPSedge™ AE430_470 SDK > OpenNI2 > Tools** and drag the captured image file to the RawFileViewer.exe. For details, refer to *Chapter 5 5.1-F*.

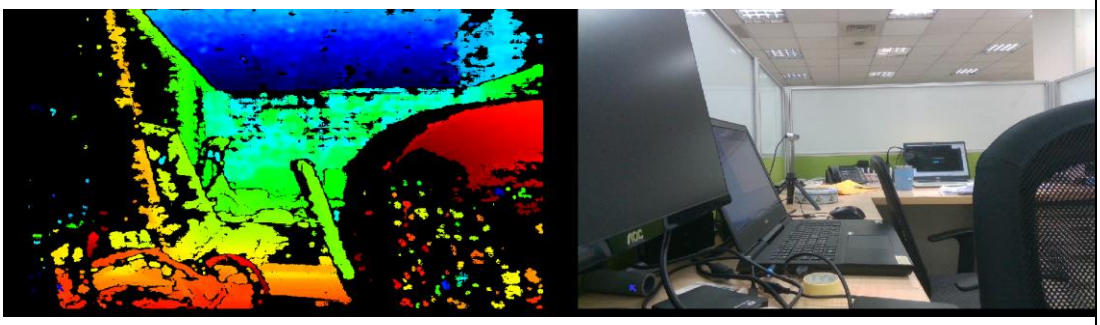


Press "c." A window will pop up,
and users can choose any folder with authority to save the depth/RGB raw data.

c. DepthViewer Settings

DepthViewer relies on hotkeys, listed in the help menu, to control its functionality and adjustments. By default, the menu in DepthViewer is hidden to provide an unobstructed viewing experience. To access this menu, press Shift + ?.

Default – The help menu hidden



The help menu displayed

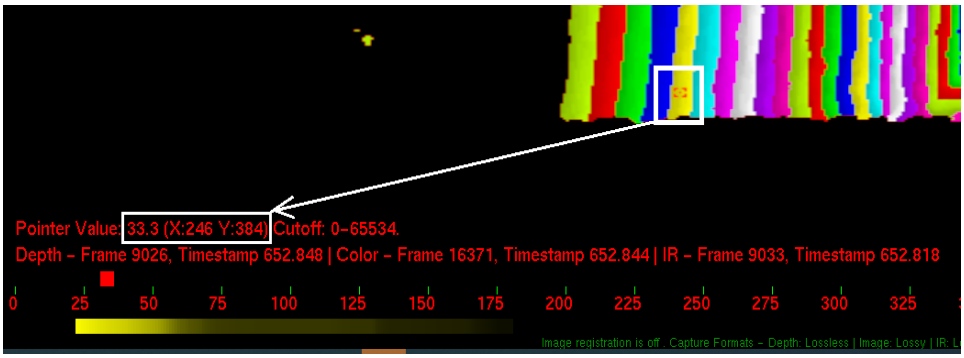
The help menu provides the following functionalities:

General

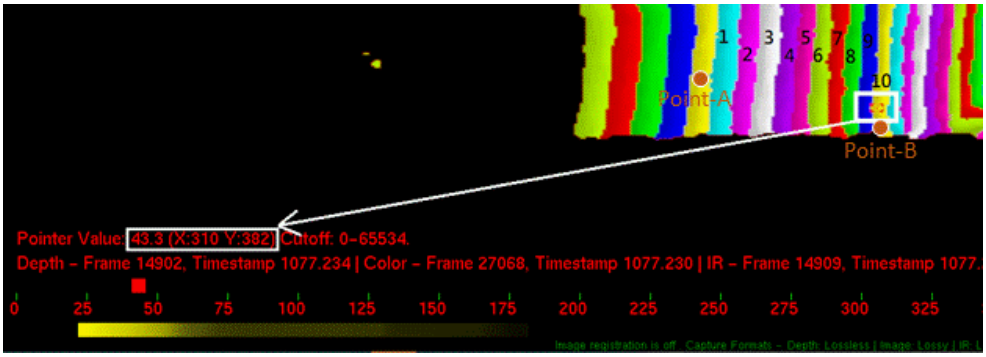
- Show / Hide Help Screen [Shift + ?]: Shows the Help Screen which contains the description of keyboard shortcuts with their functions.
- Esc: Exits DepthViewer.+

Preset

- Presets: Displays the depth/color images in 11 styles. Press the hotkey mentioned by the screen hint to select the image styles. By default, depth/color images are displayed Side By Side. In this example, LIPS Corp. demonstrates a way to assess the depth image quality using the psychedelic depth style with the pointer mode [p].
- Psychedelic depth [3]: Visualizes the depth images in a psychedelic style, aiding in the evaluation of image capturing presentation and quality.
  The value below, 33.3, represents the depth value from the camera lens to the object. (The unit is cm. X&Y represent ordinate.)

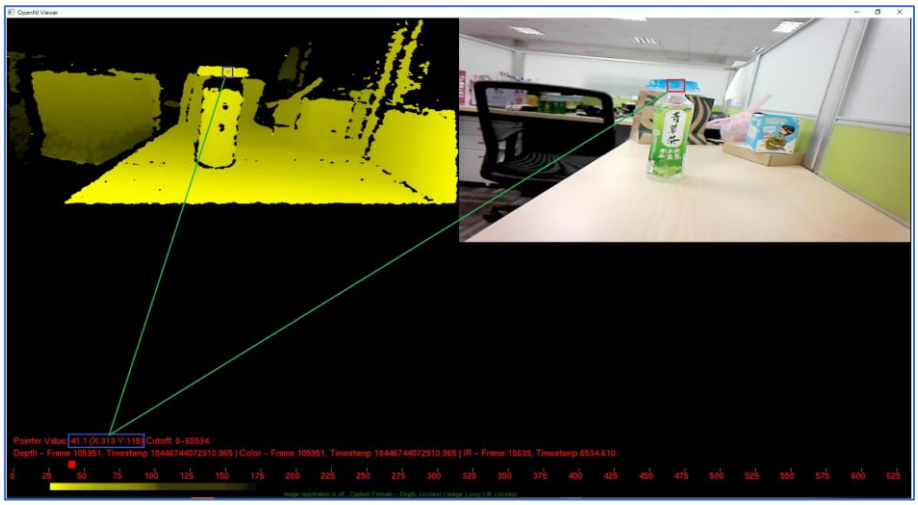


There will be 9 intervals from one color area to the same one color area; each interval means 1cm unit. This means the depth value will increase by 10cm from one color area to the same color. For example, the depth value will become 43.3 from Point A to Point B.



Display

- Pointer Mode On / Off [p]: This enables Pointer Mode to show a red dot, which indicates the depth value (unit: mm), representing the distance from the camera lens to the object located at a specific point on the image.



- Full Screen On / Off [p]: This option displays the camera images in full screen or turns off the full-screen display.
- Reset IR histogram [h]: Clears the IR histogram.
- Show/hide help screen [?]: The Help Screen contains a description of keyboard shortcuts and their functions.

Device

- Depth-Color Frame Sync [y]: Synchronize the timing between depth/color images.
- Depth-IR Frame Sync [u]: Synchronize the timing between depth/color images.
- Zoom crop on / off [z]: Enable/disable a cropping mode that magnifies the displayed area, focusing on a specific region of the image.
- Mirror All [m]: Flips the streaming image horizontally for every stream.
- Reset all croppings [/]: Reset the cropping area previously assigned.
- Toggle Auto Exposure [a]: Automatically adjusts exposure settings for optimal image quality.
- Toggle AWB [q]: Enables or disables automatic white balance adjustment.
- Increase Exposure [e]: Raises the camera's exposure level for brighter images.

- Decrease Exposure [E]: Lowers the camera's exposure level for darker images.
- Increase Gain [g]: Enhances image brightness by increasing the camera's gain.
- Decrease Gain [G]: Reduces gain to control image brightness.
- Toggle Close Range [x]: Toggles between close-range and default focus settings.
- Toggle Image Registration [i]: Activates or deactivates image registration.
- IR Emitter On / Off [t]: Turns the infrared emitter on or off for depth image capture.

Player

- Pause / Resume [Space]: Pauses the playback of the recording or resumes playback.
- Read one Frame [;]: This function appears only when the playback is paused. Click to load the playback image of the next frame.

Capture

- Start [s]: Assign a path to save the recording files and start recording images.
- Start (5 sec delay) [d]: Recording images 5 seconds upon clicking this function.
- Stop [x]: Stops recording camera image.
- Capture current frame only [c]: Saves the current frame as an image file.

d. IP Address Configuration

The LIPSedge™ AE430 / AE470 camera comes with a default IP address of **192.168.0.100** However, exceptions may exist where the camera's IP address differs from the default setting. In such cases, LIPS Corp. offers a LIPSedge™ AE430 / AE470 SDK Toolkit to facilitate IP address detection and access to camera images. Detected camera IP addresses should be saved in a **network.json file** and placed in the following folder:

- **LIPSedge™ AE430_AE470 SDK\OpenNI2\Tools\OpenNI2\Drivers**

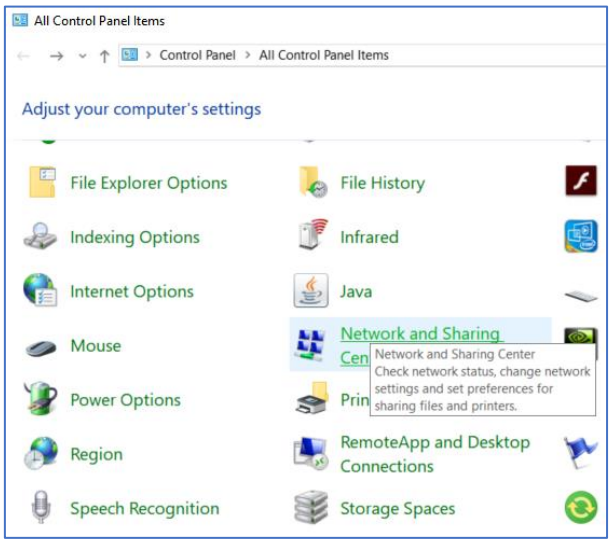
Once the camera's IP address is configured and saved, camera images can be accessible by launching the DepthViewer.

Note:

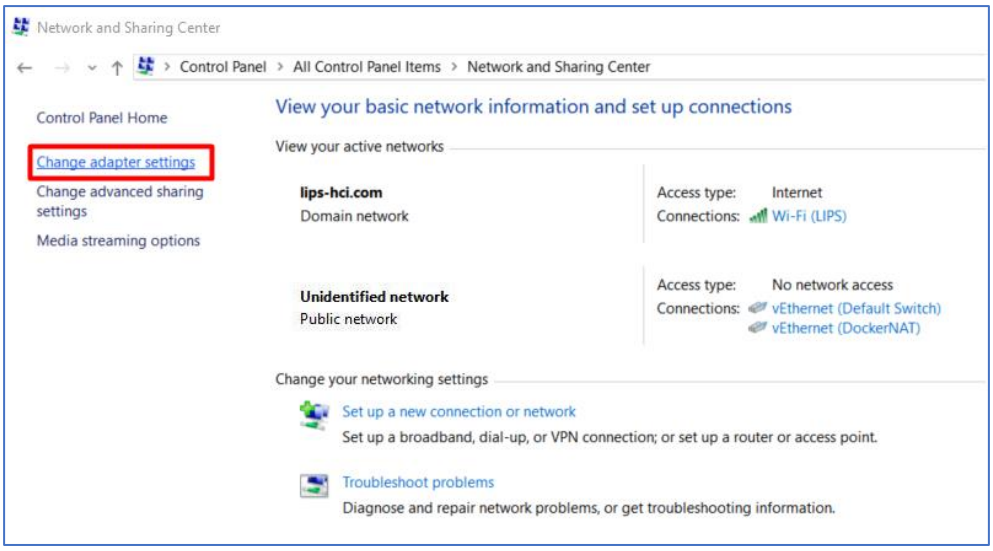
1. LIPSedge™ AE430 / AE470 is assigned a default IP address of 192.168.0.100. For camera connection, ensure the host PC / laptop is under the same subnet as the camera.
2. On rare occasions, the application may not be able to detect the camera when a new camera is connected. In that case, **unplug the network cable restart** the host PC / laptop, and scan again.

---

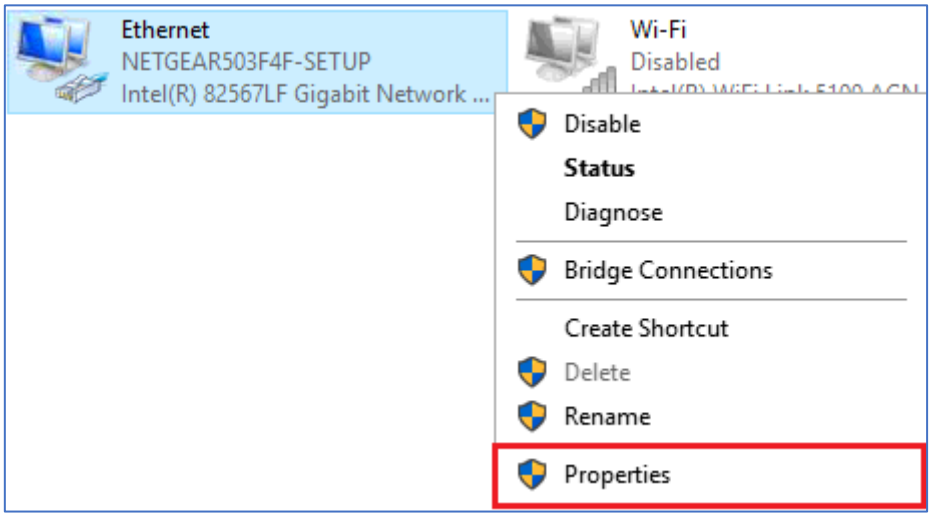
1. Go to the **Control Panel** of the host PC / laptop and select **Network and Sharing Center**.



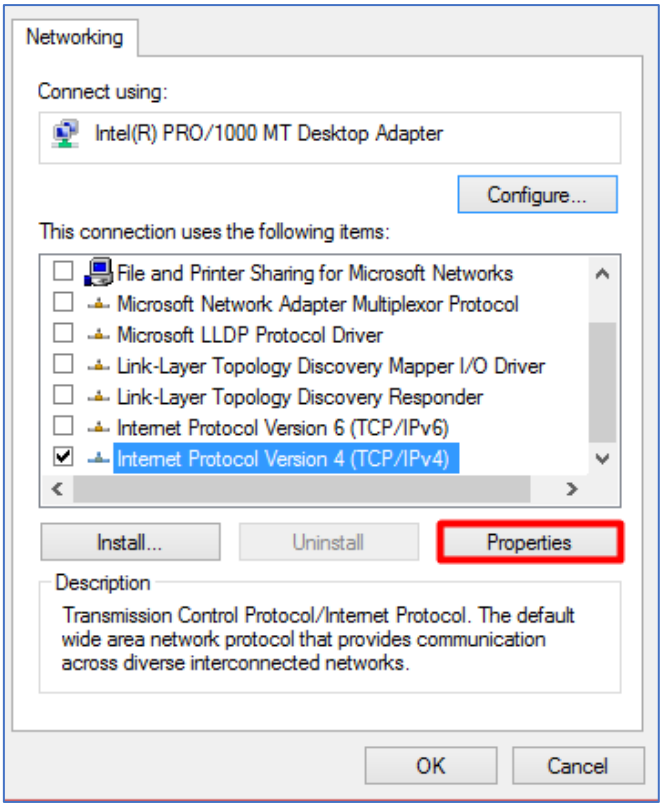
2. On the left menu, select **Change adapter settings**.



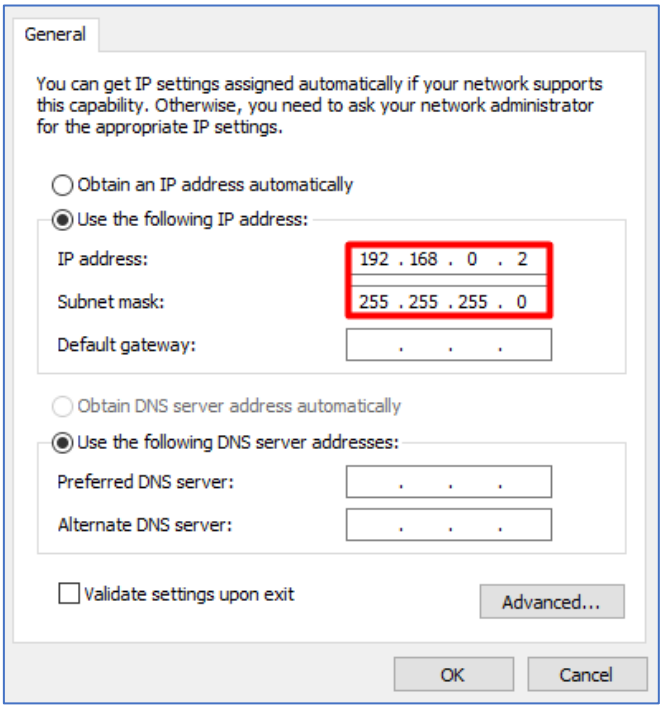
3. Right-click **Ethernet** and select **Properties**.



4. Select **Internet Protocol Version 4 Properties (IPv4)** and click **Properties**.



5. Assign the host PC / laptop to the **same subnet as the LIPSedge™ camera** and click **OK**.
   IP address: 192.168.0.2
   Subnet mask: 255.255.255.0



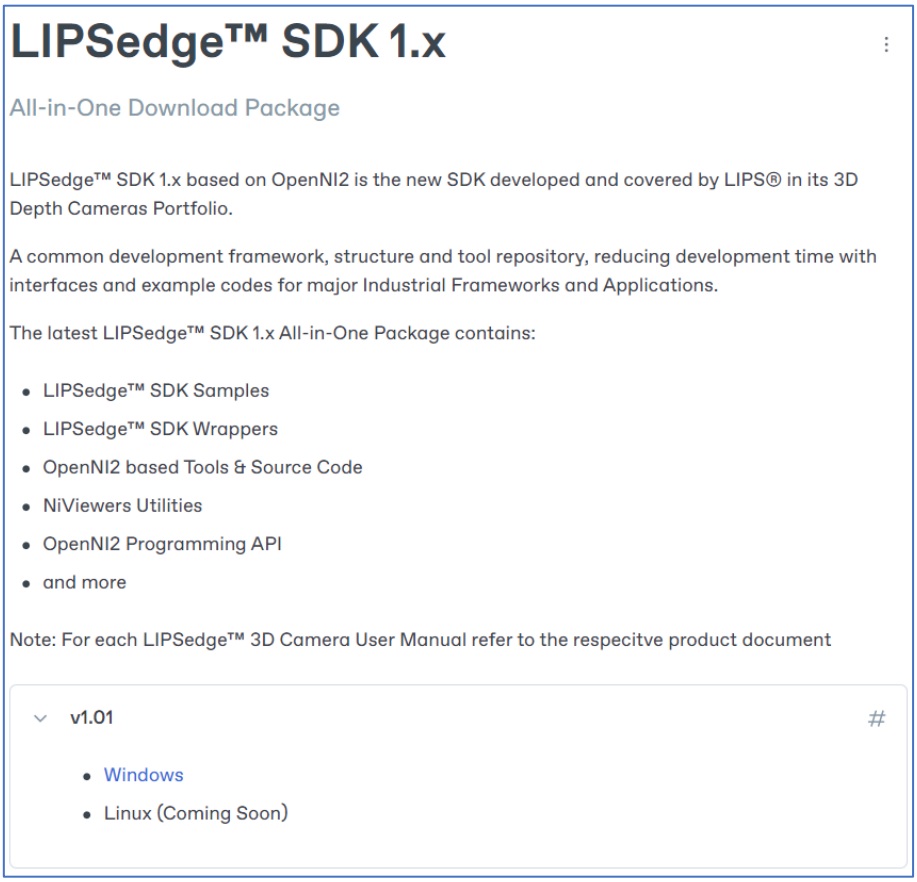
B. Linux / Ubuntu Installation

a. SDK Installation

To access the SDK, visit [3D Depth Camera SDK Free Download | LIPSedge™ SDK (lips-hci.com)] and procure the package for the preferred version, framework, and compatible operating system.

1. Visit [LIPSedge™ SDK] website.

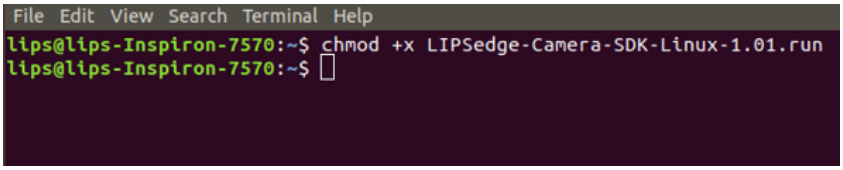
2. Select the installation file based on the compatible operating system and download the installation file.



3. Start **terminal** and go to **the installation file's location**. In this example, /home is used.

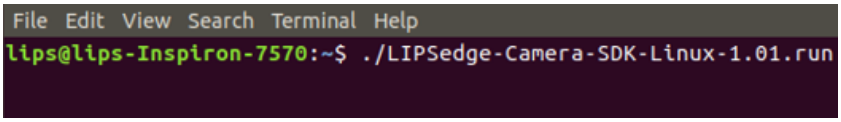
4. Change the **access permission** of the installation file. **Version 1.01 is an example;** please key in the version users download.

```
chmod +x LIPSedge-Camera-SDK-Linux-1.01.run
```

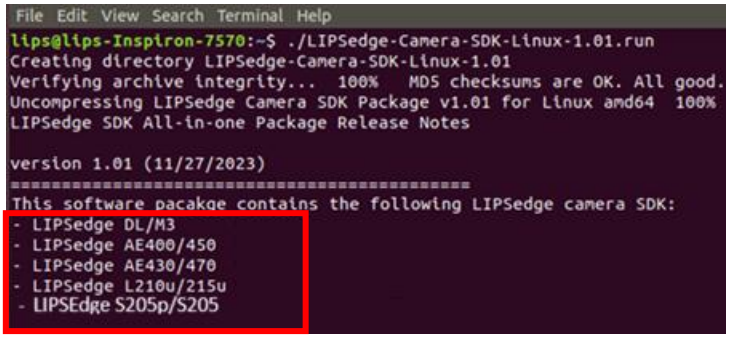


5. Execute the installation file.

```
./LIPSedge-Camera-SDK-Linux-1.01.run
```



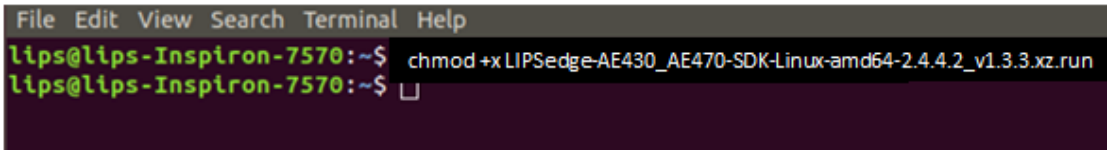
6. The file will be decompressed into model-specific installation files.



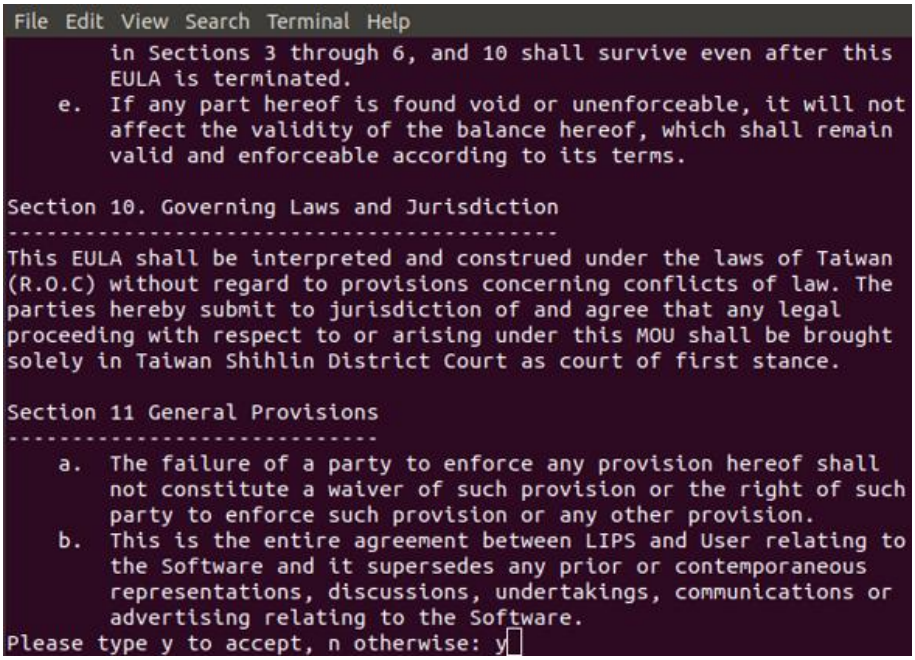
7. Go to **the folder with the installation file for the intended model** and execute the installation file. In this example, AE430_AE470-SDK-Linux-amd64-2.4.4.2_v1.3.3.xz.run is used.

```
chmod +x LIPSedge-AE430_AE470-SDK-Linux-amd64-
2.4.4.2_v1.3.3.xz.run
```

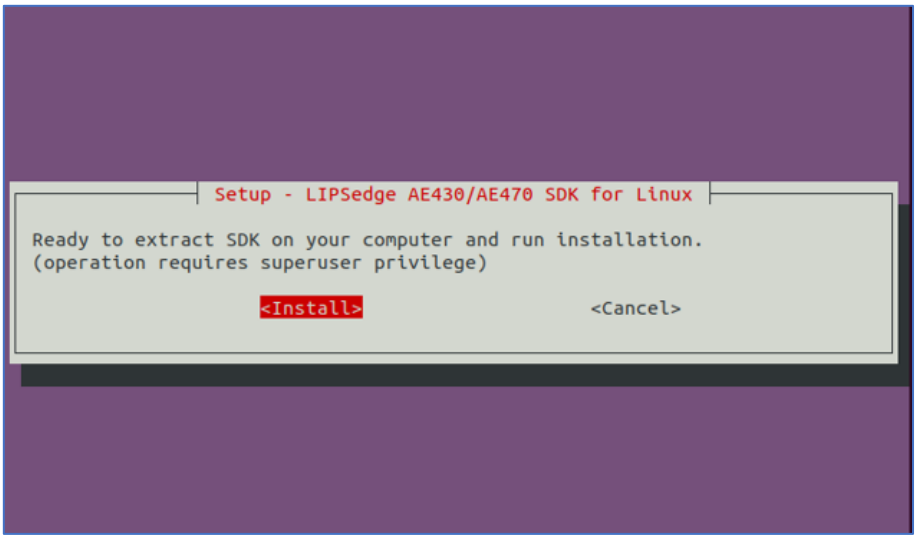
```
chmod +x LIPSedge-AE430_AE470-SDK-Linux-amd64-2.4.4.2_v1.3.3.xz.run
```



8. Press **Y**.



9. Select **Install**.



10. Once the installation is successful, the LIPSedge™ SDK and its relevant components are accessible at the **installation location**. In this example, the installation location is ./home. For the folder details, refer to similar content in *Chapter3 3.2-A-b.*

b. Camera Access

LIPSedge™ AE430 / AE470 SDK (OpenNI-based) utilizes DepthViewer, OpenNI's signature tool, for examining and assessing the quality of depth, RGB, and point cloud images. Refer to *Chapter3 3.1-A-b* for details.

c. DepthViewer Settings

DepthViewer relies on hotkeys listed in the help menu to control its functionality and adjustments. The hotkey functions for the Linux version of the DepthViewer are identical to those of its Windows counterpart. Refer to *Chapter3 3.1-A-c* for details.

d. IP Address Configuration

The LIPSedge™ AE430 / AE470 comes with a default IP address of **192.168.0.100**. However, exceptions may exist where the camera's IP address differs from the default setting. In such cases, LIPS Corp. offers a LIPSedge™ AE400 Toolkit to facilitate IP address detection and access to camera images. Detected camera IP addresses should be saved in a **network.json file** and placed in the following folder:

- **LIPSedge™ AE430_AE470 SDK\OpenNI2\Tools\OpenNI2\Drivers**

Once the camera's IP address is configured and saved, proceed to set up the host PC / laptop as the same subnet within the camera's network so the camera images can be accessible by launching the DepthViewer.

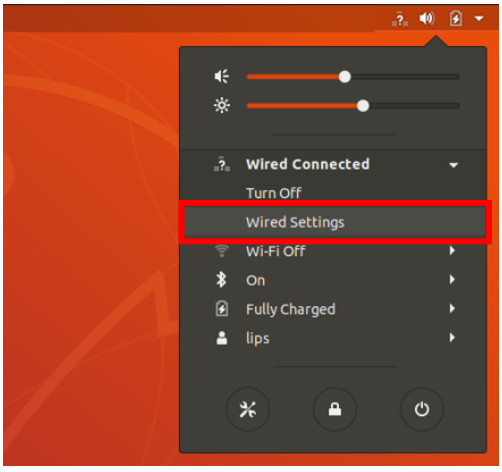
Note:

1. LIPSedge™ AE430 / AE470 is assigned with a default IP address of **192.168.0.100**. Make sure the host PC / laptop is under the same subnet as the camera for camera connection.
2. On rare occasions, the application may not be able to detect the camera when a new camera is connected. In that case, **unplug the network cable and restart** the host PC / laptop, and scan again.

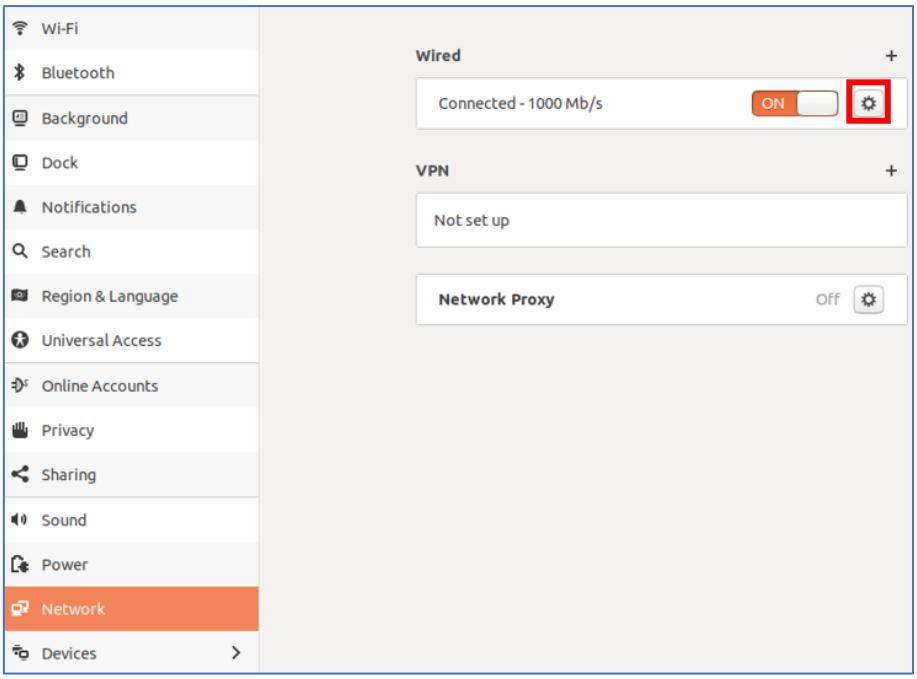
---

1. Connect the LIPSedge™ AE430 / AE470 camera to the host PC / laptop. For details, refer to *Chapter1 1.2-C.*

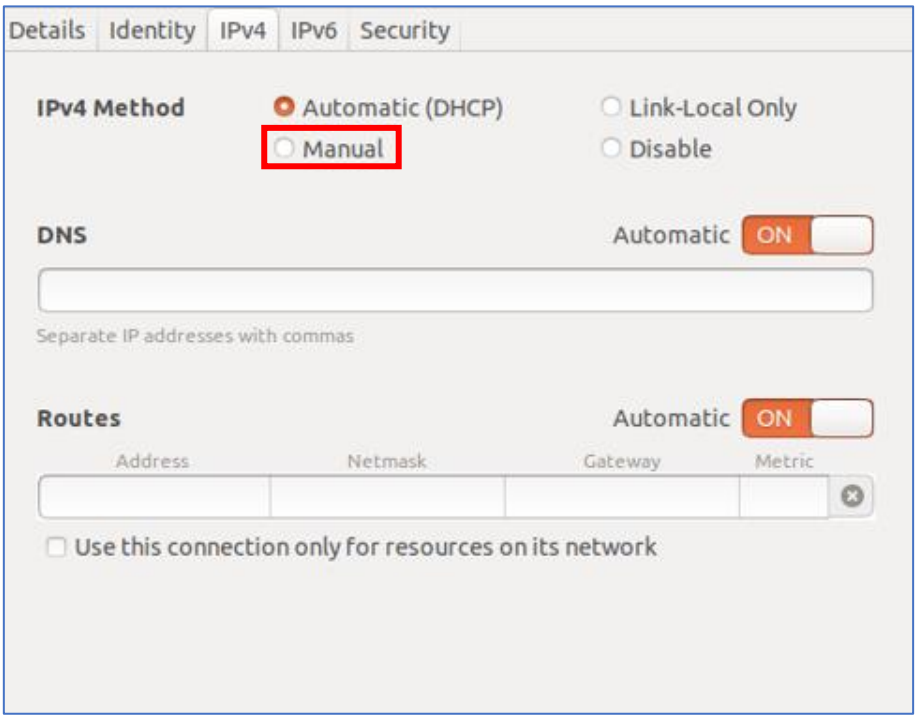
2. Go to the upper right corner and **click**  **> Wired Connected > Wired Settings**.



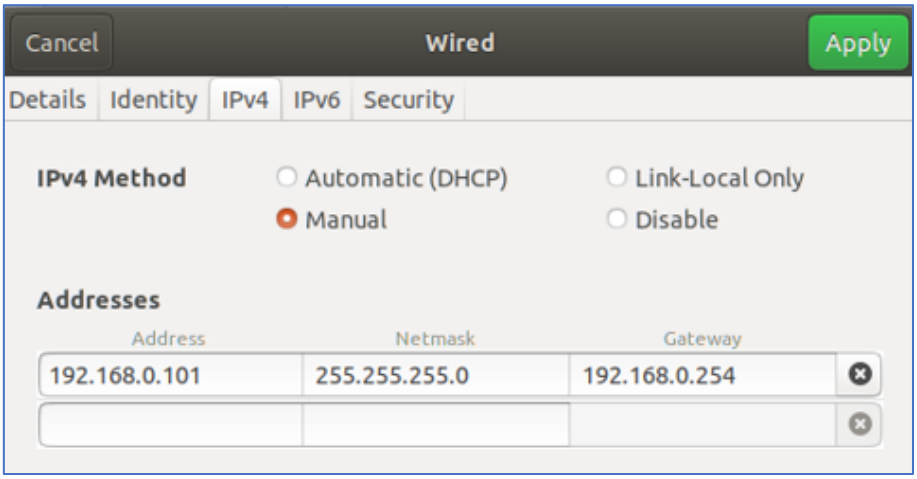
3. On the left menu, select Network and click  .



4. Go to the **IPv4** tab and select **Manual**.



5. Type the desired network configuration and click **Apply**.
   - **Address**: 192.168.0.101
   - **Netmask**:255.255.255.0
   - **Gateway**: 192.168.0.254



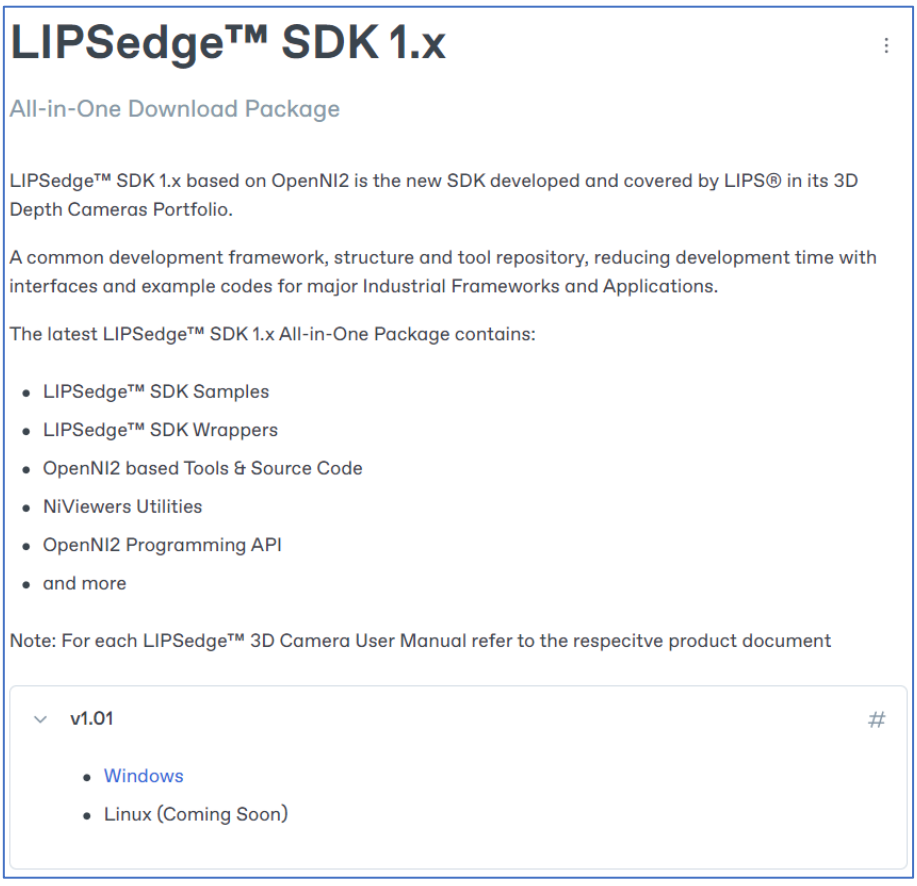
C. NVIDIA Jetson

a. SDK Installation

To access the SDK, visit [3D Depth Camera SDK Free Download | LIPSedge™ SDK (lips-hci.com)] and procure the package for the preferred version, framework, and compatible operating system.

1. Visit [LIPSedge™ SDK] website.

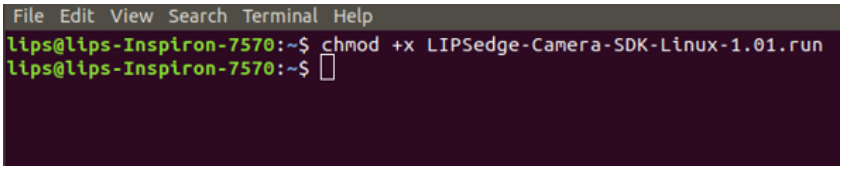
2. Select the installation file based on the compatible operating system and download the installation file.



3. Start the **terminal** and go to **the installation file's location**. In this example, /home is used.

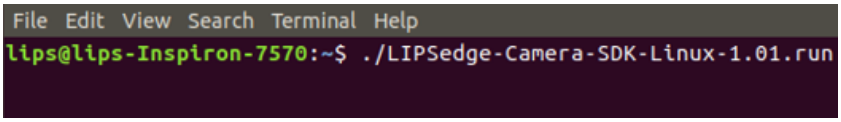
4. Change the **access permission** of the installation file. **Version 1.01 is an example;** please key in the version users download.

```
chmod +x LIPSedge-Camera-SDK-Linux-1.01.run
```

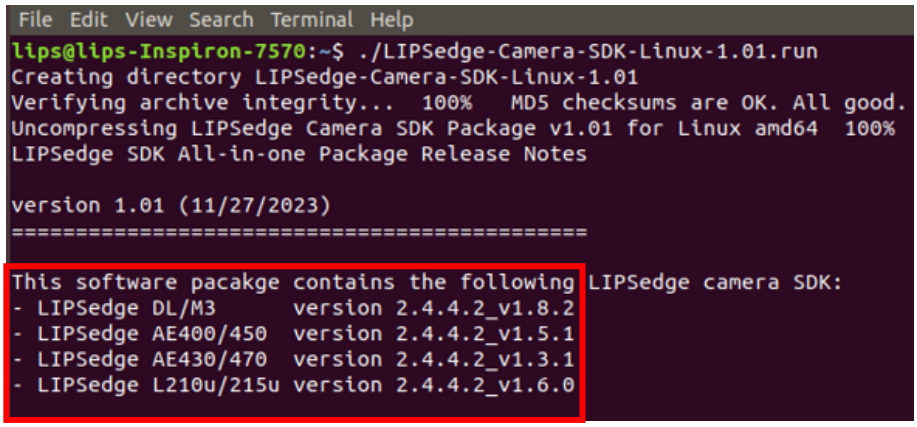


5. Execute the installation file.

```
./LIPSedge-Camera-SDK-Linux-1.01.run
```



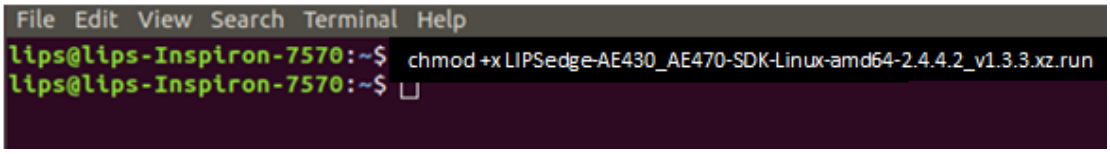
6. The file will be decompressed into model-specific installation files.



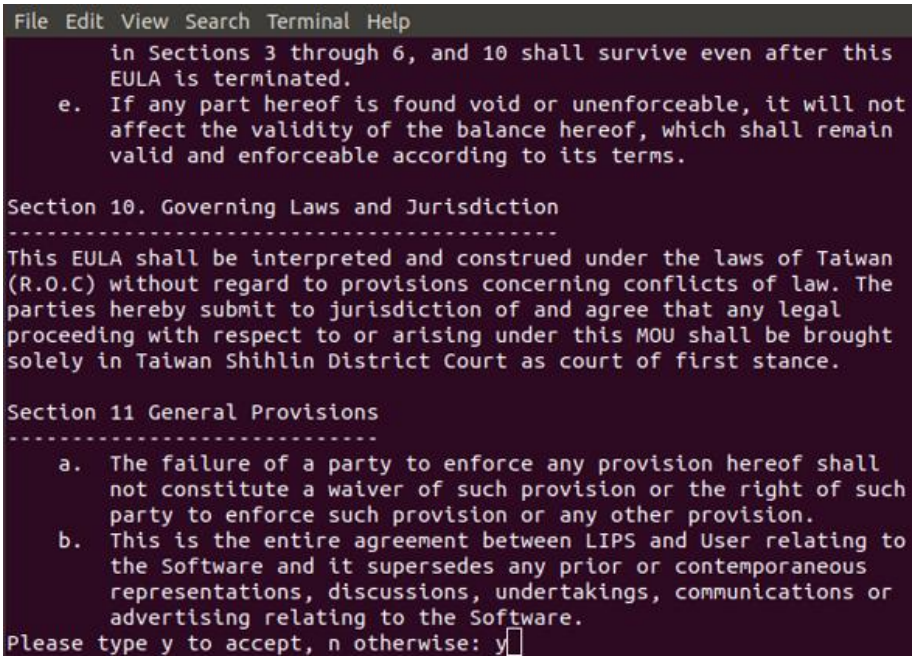
7. Go to **the folder with the installation file for the intended model** and execute the installation file. In this example, AE430_AE470-SDK-Linux-amd64-2.4.4.2_v1.3.3.xz.run is used.

```
chmod +x LIPSedge-AE430_AE470-SDK-Linux-amd64-2.4.4.2_v1.3.3.xz.run
```

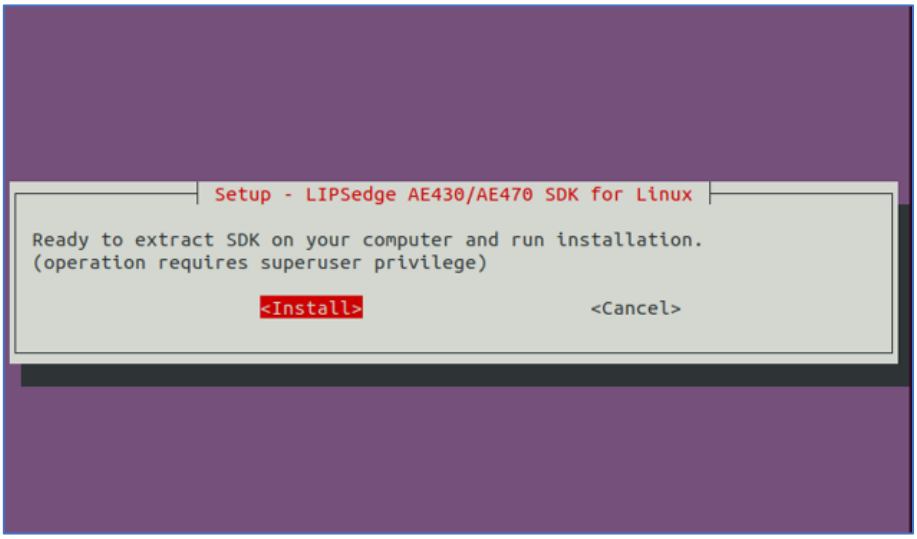

```
chmod +x LIPSedge-AE430_AE470-SDK-Linux-amd64-2.4.4.2_v1.3.3.xz.run
```

8. Press **Y**.



9. Select **Install**.



10. Once the installation is successful, the LIPSedge™ SDK and its relevant components are accessible at the installation location. In this example, the installation location is ./home. For the folder details, refer to similar content in *Chapter3 3.2-A-b.*

b. Camera Access

LIPSedge™ AE430 / AE470 SDK (OpenNI-based) utilizes DepthViewer, OpenNI's signature tool, for examining and assessing the quality of depth, RGB, and point cloud images. Refer to *Chapter3 3.1-A-b* for details.

c. DepthViewer Settings

DepthViewer relies on hotkeys listed in the help menu to control its functionality and adjustments. The hotkey functions for the Linux version of the DepthViewer are identical to those of its Windows counterpart. Refer to *Chapter3 3.1-A-c* for details.

d. IP Address Configuration

The LIPSedge™ AE430 / AE470 comes with a default IP address of **192.168.0.100**. However, exceptions may exist where the camera's IP address differs from the default setting. In such cases, LIPS Corp. offers a LIPSedge™ AE400 Toolkit to facilitate IP address detection and access to camera images. Detected camera IP addresses should be saved in a **network.json file** and placed in the following folder:

- **LIPSedge™ AE430_AE470 SDK\OpenNI2\Tools\OpenNI2\Drivers**

Once the camera's IP address is configured and saved, proceed to set up the host PC / laptop as the same subnet within the camera's network so the camera images can be accessible by launching the DepthViewer.

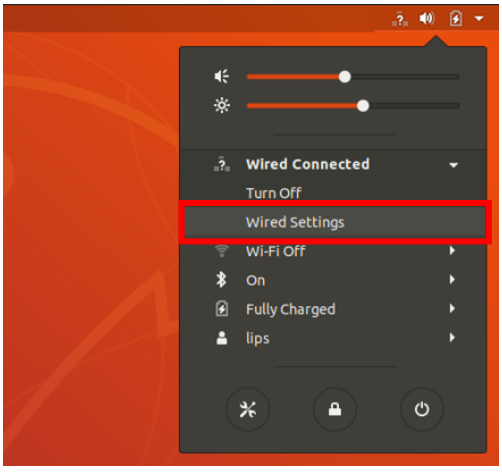
Note:

11. LIPSedge™ AE430 / AE470 is assigned with a default IP address of **192.168.0.100**. Make sure the host PC / laptop is under the same subnet as the camera for camera connection.
12. On rare occasions, the application may not be able to detect the camera when a new camera is connected. In that case, **unplug the network cable and restart** the host PC / laptop, and scan again.

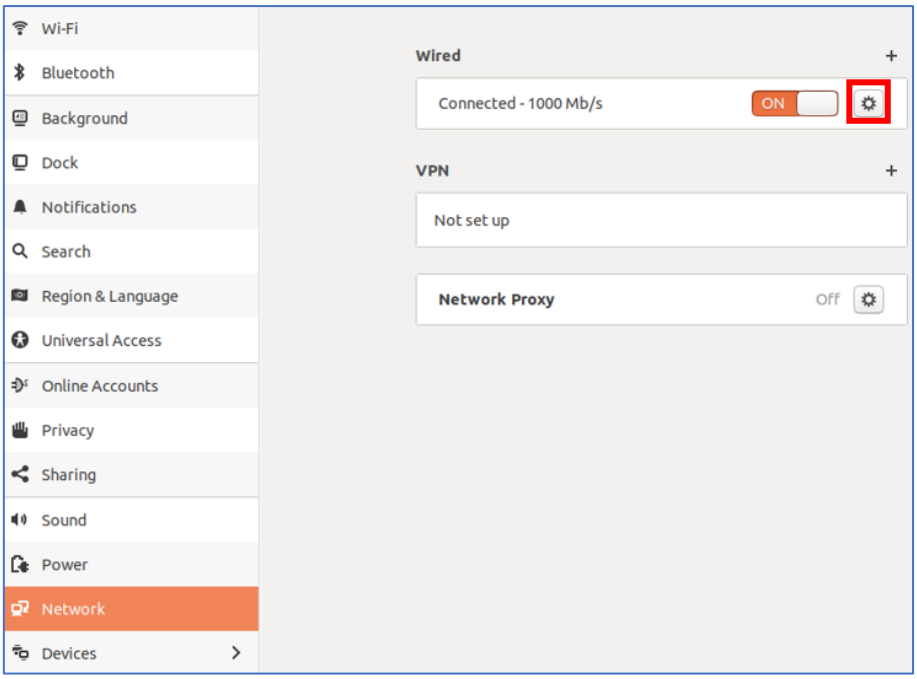
---

6. Connect the LIPSedge™ AE430 / AE470 camera to the host PC / laptop. For details, refer to *Chapter1 1.2-C.*

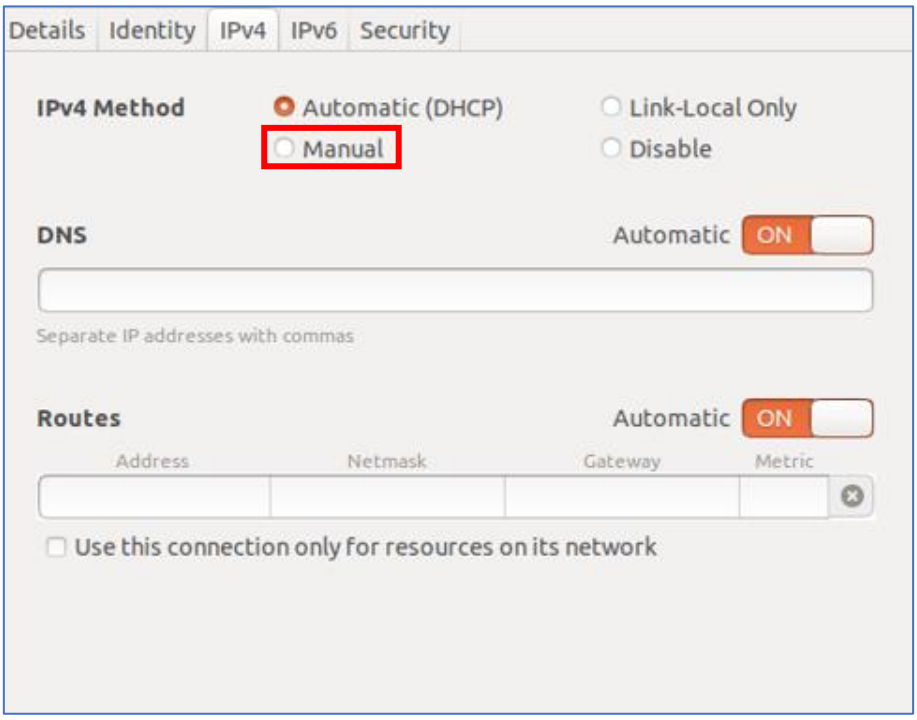
7. Go to the upper right corner and **click**  **> Wired Connected > Wired Settings**.



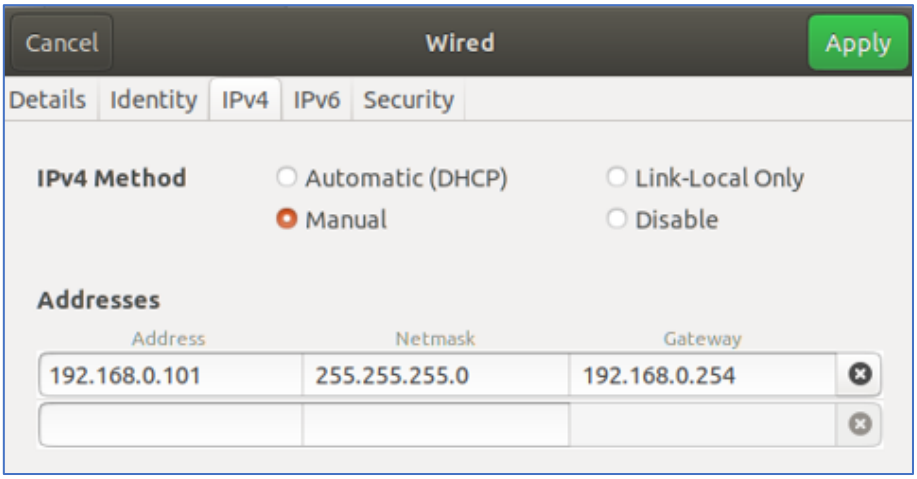
8. On the left menu, select Network and click  .



9. Go to the **IPv4** tab and select **Manual**.



10. Type the desired network configuration and click **Apply**.
    - **Address**: 192.168.0.101
    - **Netmask**:255.255.255.0
    - **Gateway**: 192.168.0.254



D. Other OS (by request)

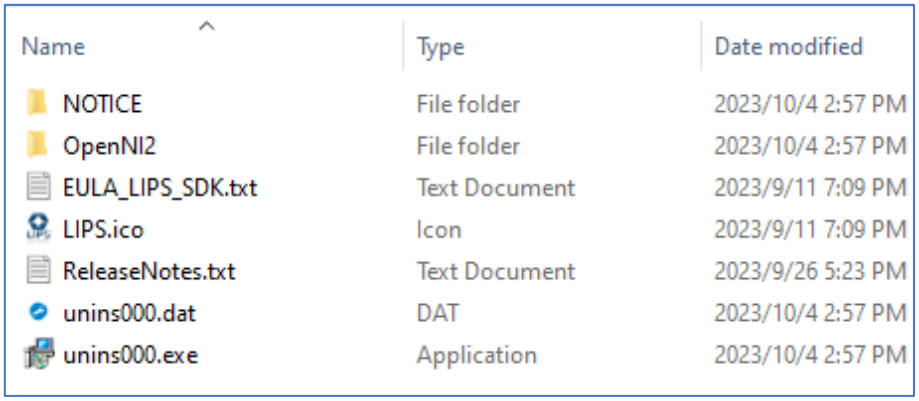
Other OS support by request.

3.2 SDK Knowledge Base

The LIPSedge™ AE430 / AE470 SDK (OpenNI-based) consists of two main components: OpenNI2 and other dependent files. Except for the OpenNI2 folder, all the other files are dependent files.

A. SDK Folder Structure

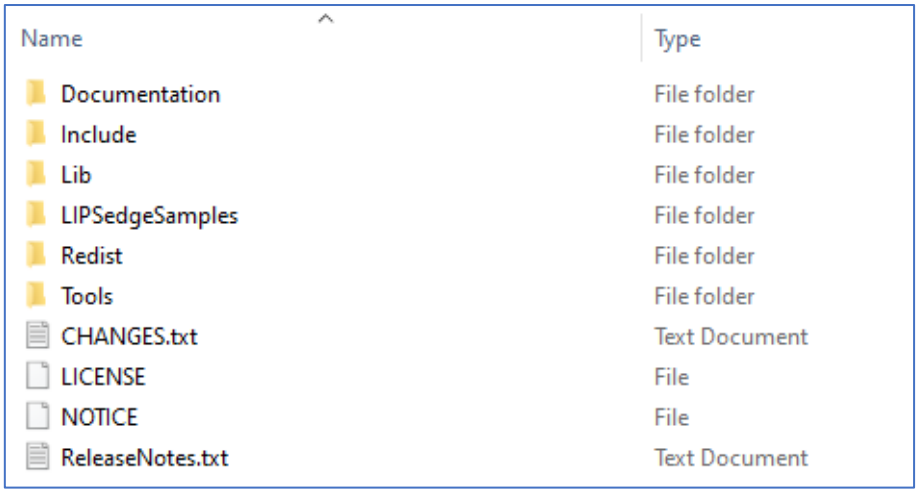
a. Windows



- NOTICE: Dependent libraries necessary for LIPSedge™ AE430 / AE470 SDK functionality. Do NOT modify or delete the folder content.
- OpenNI2: OpenNI-related files that are essential for camera integration and function control, including system configuration files and example applications.
- Auxiliary files: Supplementary information for the LIPSedge™ AE430 / AE470 SDK.
  - EULA_LIPS_SDK.txt: The end user agreement.
  - LIPS.ico: LIPS Corp.'s icon, which appears during application operation.
  - ReleaseNotes: Announcement of the latest feature.
- Uninstallation components: Run unins000.exe for uninstallation. Note that unins000.dat must be present.

[OpenNI2 Folder]

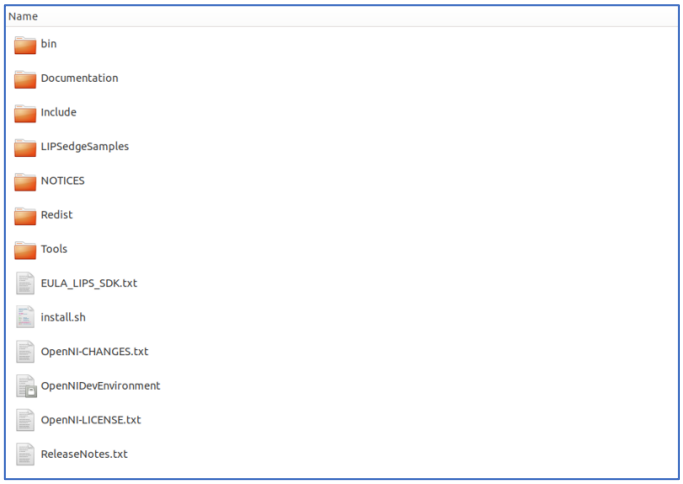
The SDK package for LIPSedge™ AE430 / AE470 provides a comprehensive set of files and folders to support camera integration and development. These resources include OpenNI C++ API documentation, header files, libraries for compilation, sample applications, system files, and important information such as licenses and release notes.



- Documentation: Contains essential OpenNI C++ API documentation.
- Include: Contains essential OpenNI C++ headers. These headers can be checked along with the associated library files to facilitate development.
- Lib: Contains library files, specifically OpenNI2.lib and realsenses2.lib. These libraries are used in conjunction with MS Visual Studio C++ for compilation.
- LIPSedgeSamples: Contains a series of executable tools and the source code of these tools.
- Redist: Contains network configuration files, camera drivers and system files necessary for image streaming.
- Tools: Holds captured frames from example programs and other camera configuration files.
- CHANGES: The change log for OpenNI.
- LICENSE: Contains information about the licensing terms for the SDK.
- NOTICE: Contains copyright and attribution notices relevant to the OpenNI components.
- ReleaseNotes: The latest system requirements for OpenNI.

b. Linux

In LIPSedge™ AE430 / AE470 SDK (OpenNI-based) for the Linux system, the folders are structured in a way that the OpenNI2 and dependency files are **adjacent to the application that requires these external resources**. Go to **./home/LIPSedge-Camera-SDK-Linux/LIPSedge[Model]-SDK** for OpenNI C++ API documentation, header files, libraries for compilation, sample applications, system files, and important information such as licenses and release notes.



- **bin**: Consists of the USB driver files for the LIPS camera.
- **Documentation**: Contains essential OpenNI C++ API documentation.
- **Include**: Contains essential OpenNI C++ headers. These headers can be checked along with the associated library files to facilitate development.
- **LIPSedgeSamples**: Contains a series of executable tools and the source code of these tools.
- **Redist**: Contains network configuration files, camera drivers, and system files necessary for image streaming.
- **Tools**: Holds captured frames from example programs and other camera configuration files.
- **EULA_LIPS_SDK.txt**: The end user agreement.
- **Install.sh**: In cases where the Linux / Ubuntu SDK installation was aborted, execute install.sh to install the SDK.
- **OpenNI-CHANGES.txt**: The change log for OpenNI.
- **OpenNI-LICENSE.txt**: Contains information about the licensing terms for OpenNI.
- **NOTICE**: Contains copyright and attribution notices relevant to the OpenNI components.
- **ReleaseNotes**: The latest system requirements for OpenNI.

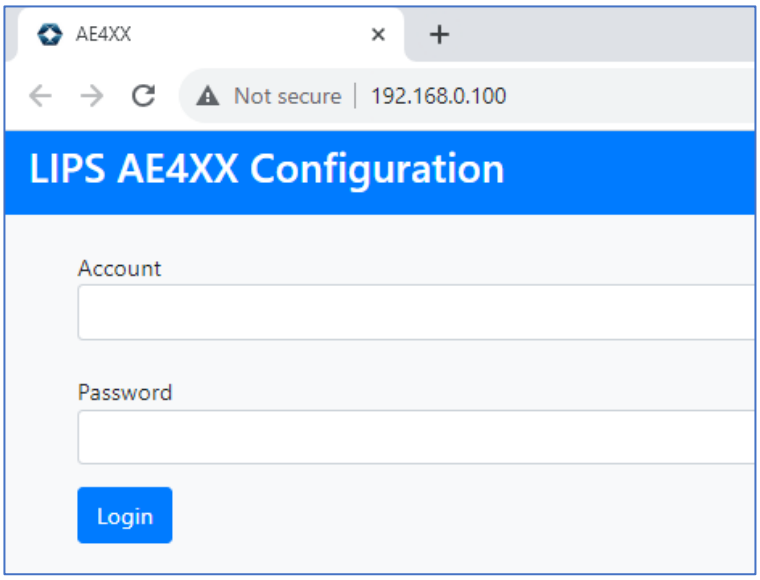
B. SDK Setting Configuration

This section does NOT apply to **LIPSedge™ AE430 / AE470**.

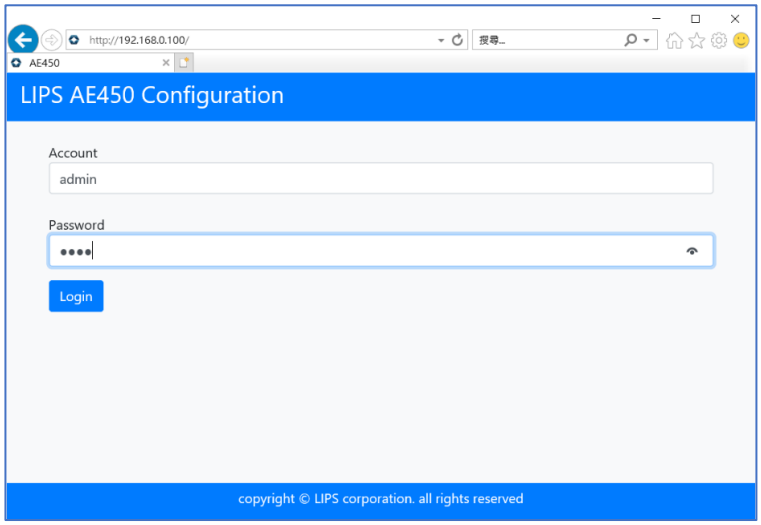
C. Camera Web Interface

LIPSedge™ AE430 / AE470 camera can be accessible through **its web interface**, which facilitates the configuration of various device and network settings. It is recommeded to use **Microsoft Internet Explorer 10.0 (or equivalent)** for optimal performance.

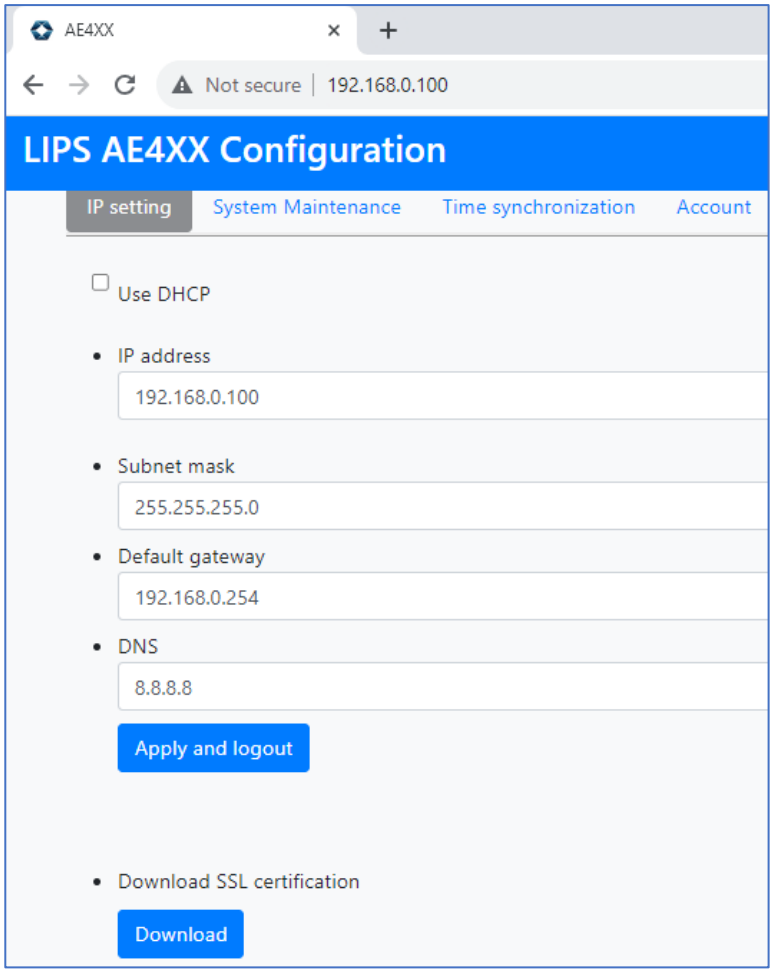
1. Start the web browser. In the **Search Bar**, type the **IP address** of the LIPSedge™ AE430 / AE470 camera.



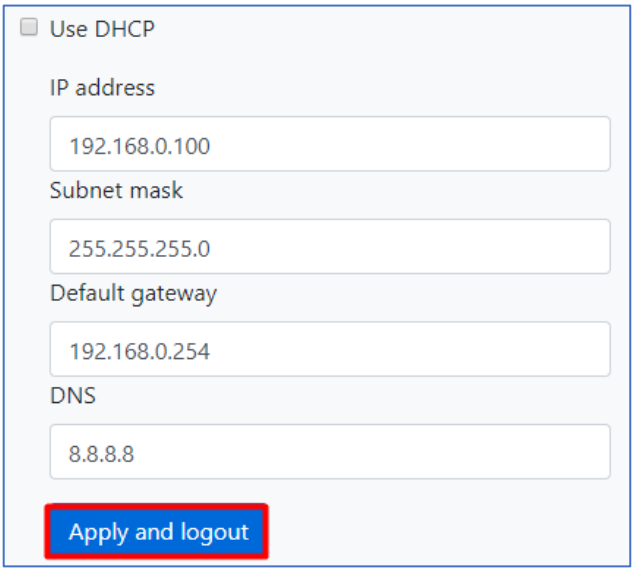
2. On the login page, type the **default username** and **password** and click Login.
   Username: admin
   Password: LIPS



3. Navigate the top bar to change system settings.

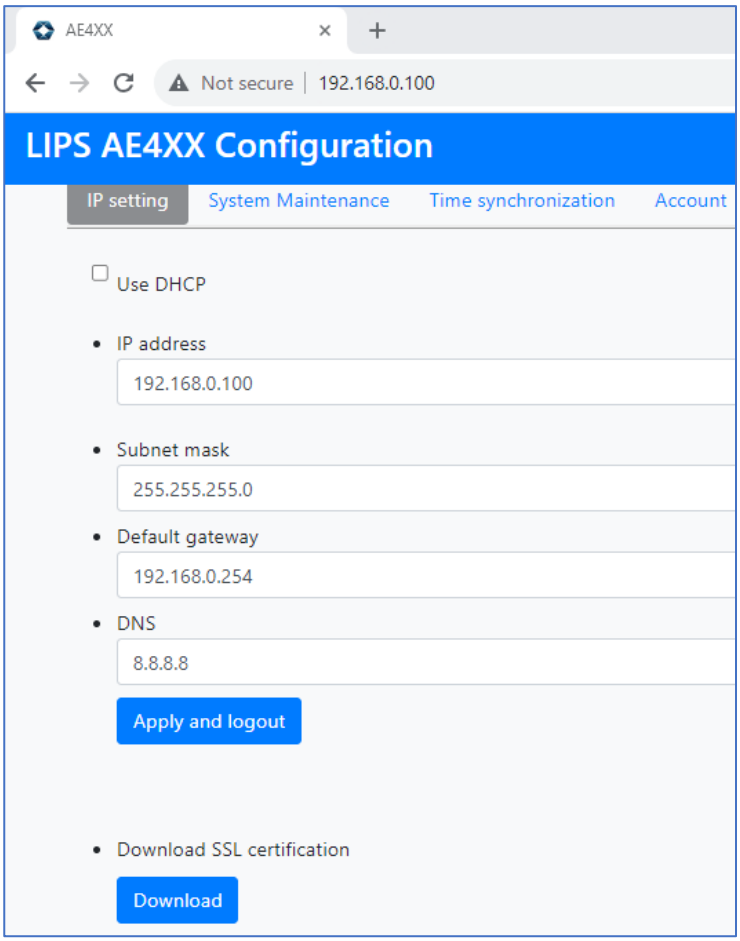


4. After modifying the system settings, click **Apply and logout** to save the changes.



a. IP Settings

The **IP Settings** tab allows the adjustment of the network setting of the LIPSedge™ AE430 / AE470.



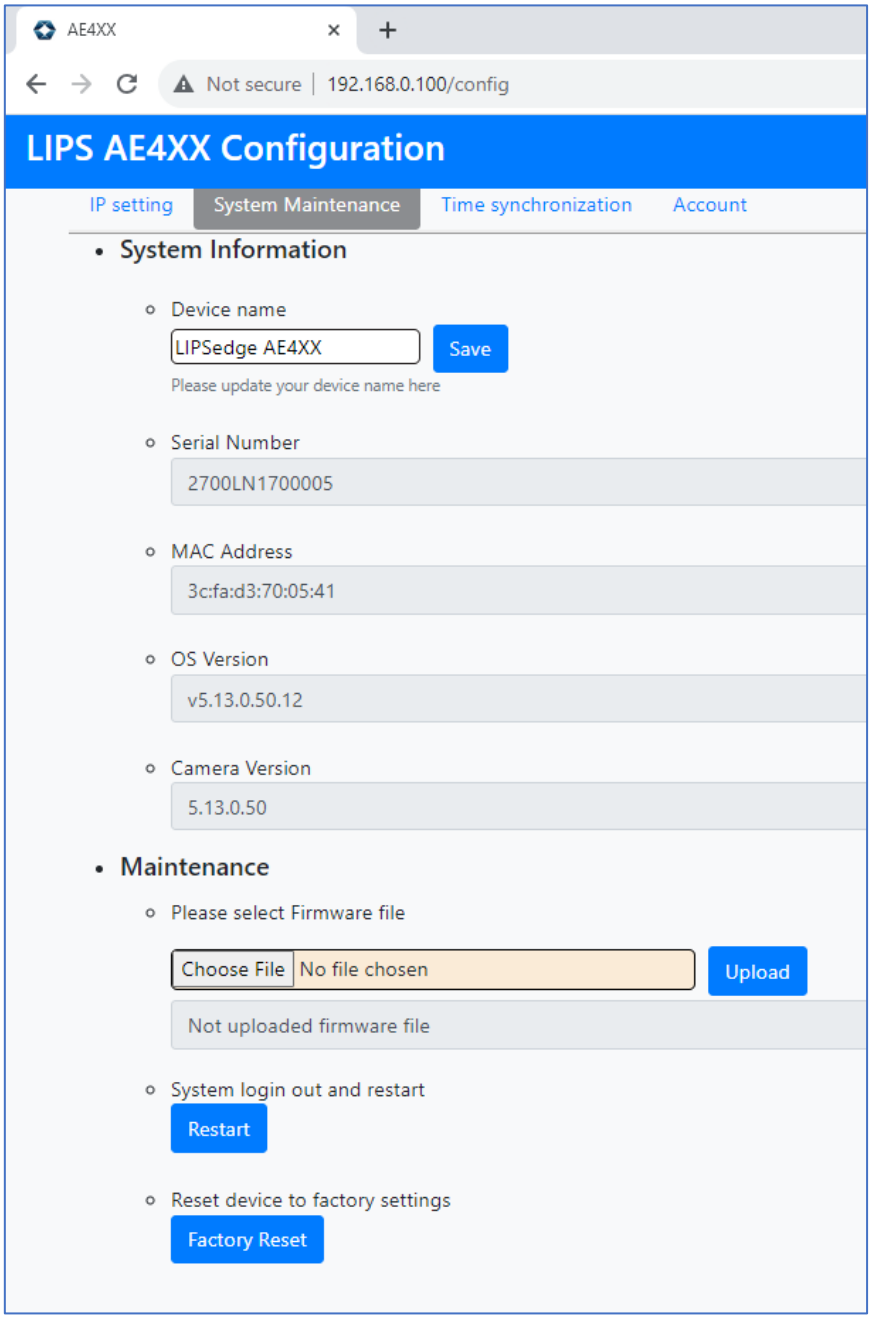
- **Use DHCP**: This option assigns an IP address to the camera automatically through the DHCP service. Disabling manually defined network properties will also be disabled.
- **Network Properties**: Manually type the Internet connection's IP address, Subnet mask, Default gateway, and DNS server.
- **Download SSL certification**: Generates an SSL server certification file for upgrading transmission security.

WARNING: The IP address field is empty despite appearing to have a default IP address in gray-out texts. **Type an IP address** before clicking **Apply and logout** or the camera's IP address becomes unreachable, which requires the camera to be restored to its default settings to fix the IP address issue. To restore the camera to its default settings, refer to *Chapter1 1.2-C*

---

b. System Maintenance

The **System Maintenance** tab offers access to the camera's hardware and system information, firmware updates, camera restart, and the option to restore the camera to its factory default settings.



[System Information]

- Device Name: Edits the device's name. The default device name is LIPSedge™ AE430 / AE470.
- Serial Number: Displays the camera's internal Intel® RealSense™ sensor serial number.
- MAC Address: Displays the MAC address unique to the camera.
- OS Version: Displays the current LIPSedge™ AE430 / AE470 SDK version.
- Camera Version: Displays the current camera firmware version.
- Camera Serial Number: Displays the camera's serial number.

[Maintenance]

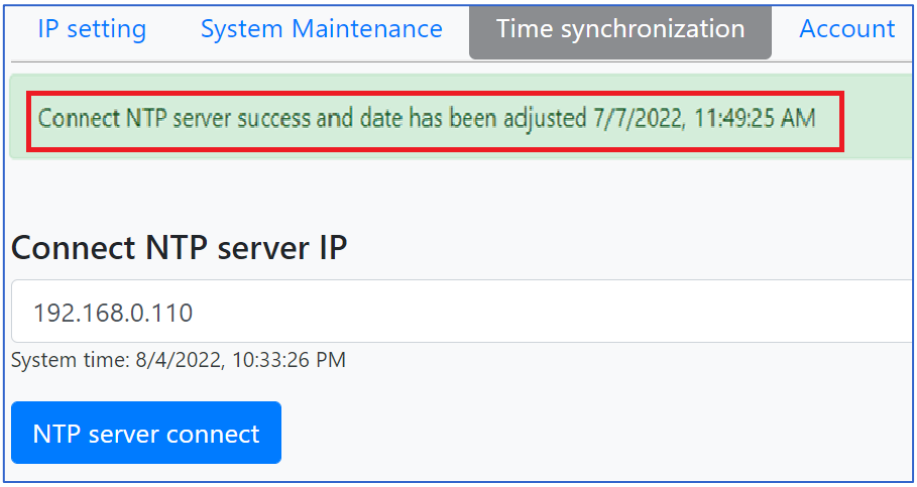
- Firmware Upgrade: Upload the latest firmware from your local PC / laptop and clicks Restart and Update device for firmware upgrade. For details, refer to *Chapter3 3.2-C-e.*
- Restart device: Clicks Restart.
- Restore the device to factory settings: Clicks Factory Reset.

c. Time Synchronization

This tab allows the alignment of the camera's internal clock with an extenal NTP server. Make sure the camera has a good Internet connection when connecting to the NTP server. Type the NTP server's address and click **NTP server connect**. The updated system time will be displayed at the bottom of the NTP address field.

[External NTP server]

Type the NTP server's address and click **NTP server connect**. The updated system time will be displayed at the bottom of the NTP address field.



[Local NTP Server]

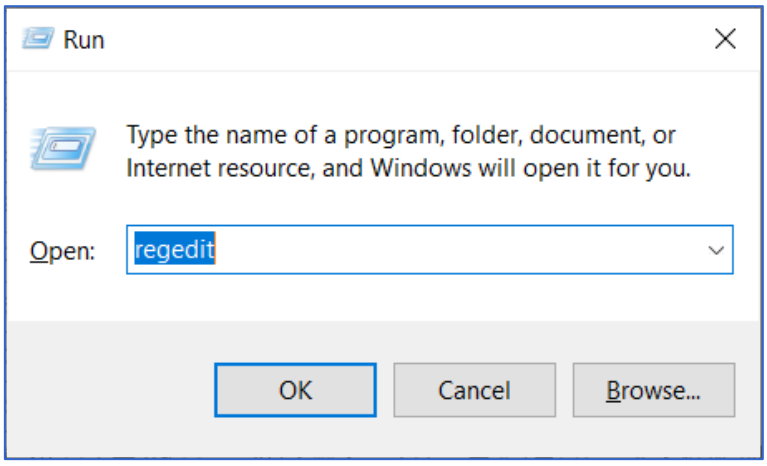
If the camera fails to access an external NTP server,refer to the following section to set up the local NTP server. Make sure the host PC is connected to LIPSedge™ AE430 / AE470, with proper network configurations.

[Enable Local NTP server]

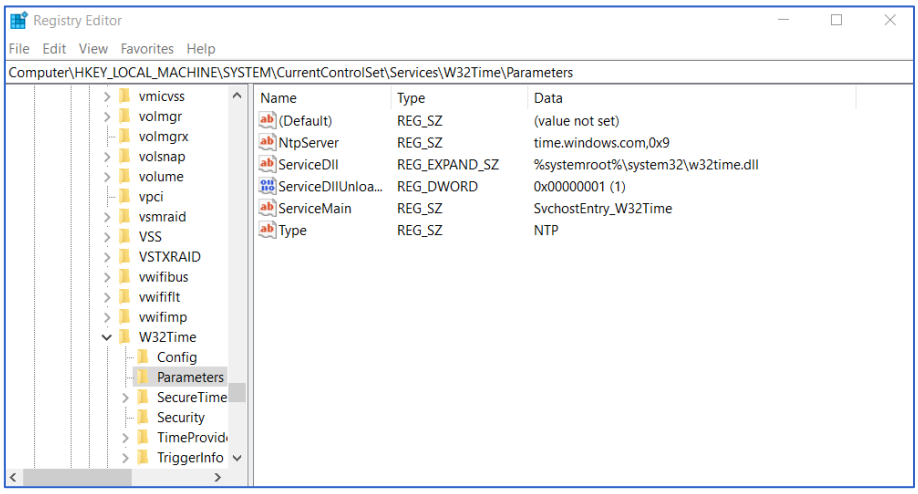
To enable the local NTP server, modify the **Registry file**:

1. Start **Windows Run (Windows Key + R)**.

2. Enter **regedit** and click **OK**.



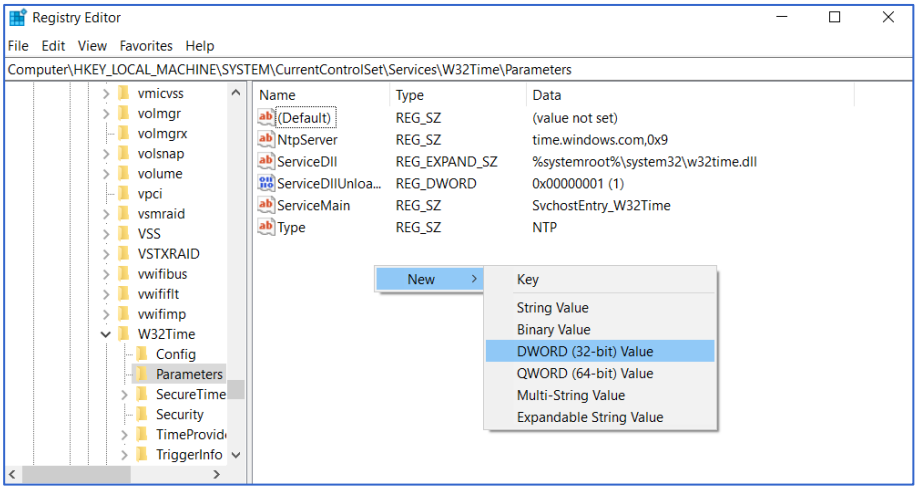
3. Navigate to the registry **Key**:
   Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Parameters



4. Confirm the registry value **LocalNTP** (Type: REG_DWORD).

Note: If LocalNTP was absent, create the value.

1. Right-click in the Registry Editor, select **New > DWORD (32-bit value)**, and type **LocalNTP** (note that this name is case sensitive).



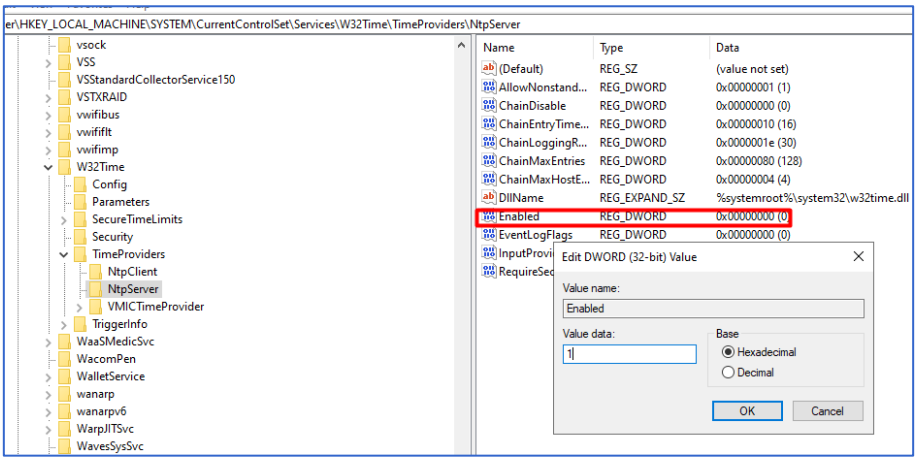
2. Double-click **LocalNTP** and change the following parameters:
   - **Value data**:1
   - **Base**: Hexadecimal

3. Click **OK**.

[Update the Windows Registry to Configure the Time Provider]

1. Navigate to the registry
   Key:
   Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\Ntp Server

2. Double-click **Enabled**, and change the following parameters:
   - **Value data**: 1
   - **Base**: Hexadecimal

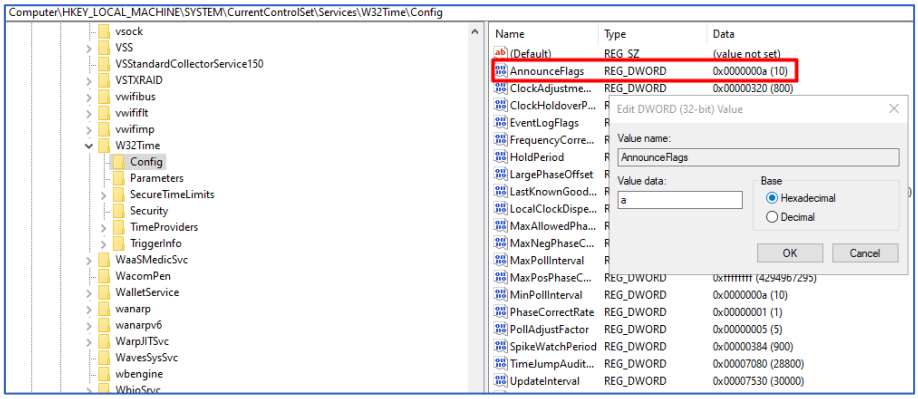


3. Click **OK**.

[Update the Windows Registry to Configure the Announce Flags]

1. Navigate to the registry
   Key:
   Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config

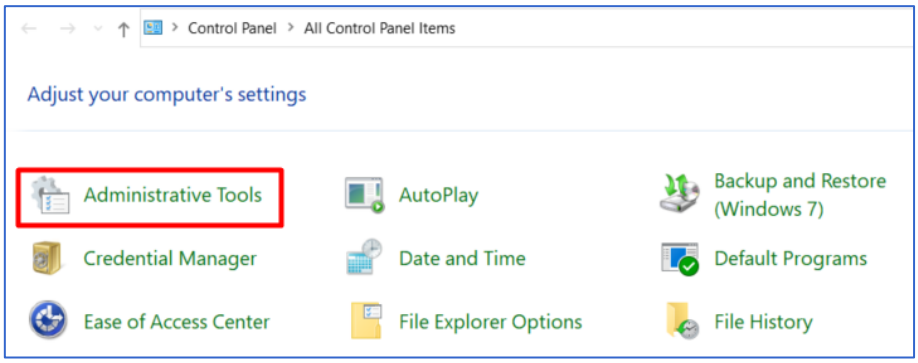
2. Double-click AnnounceFlags, and change the following parameters:
   - **Value data**: 5
   - **Base**: Hexadecimal



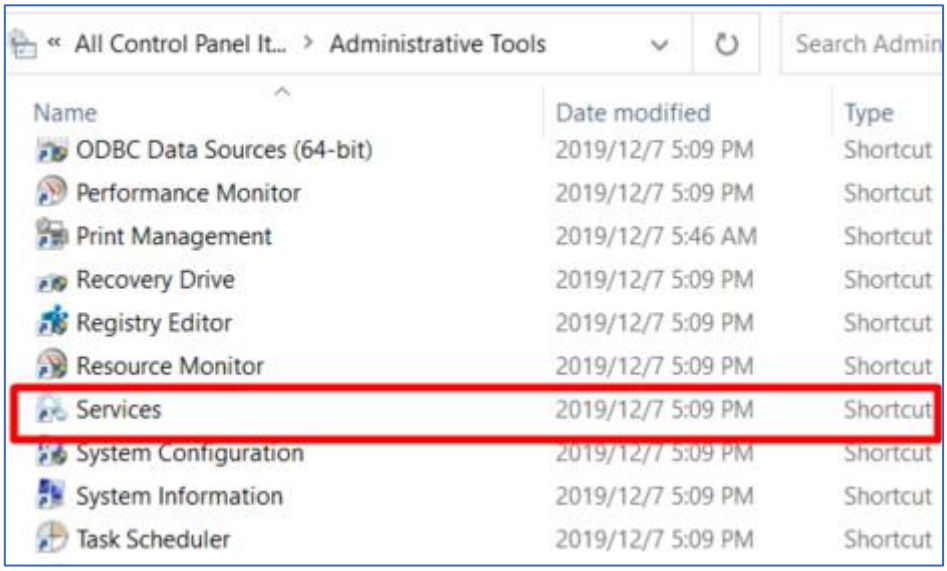
3. Click **OK**.
4. Close the Registry Editor.

[Start the Local Windows NTP Time Service]

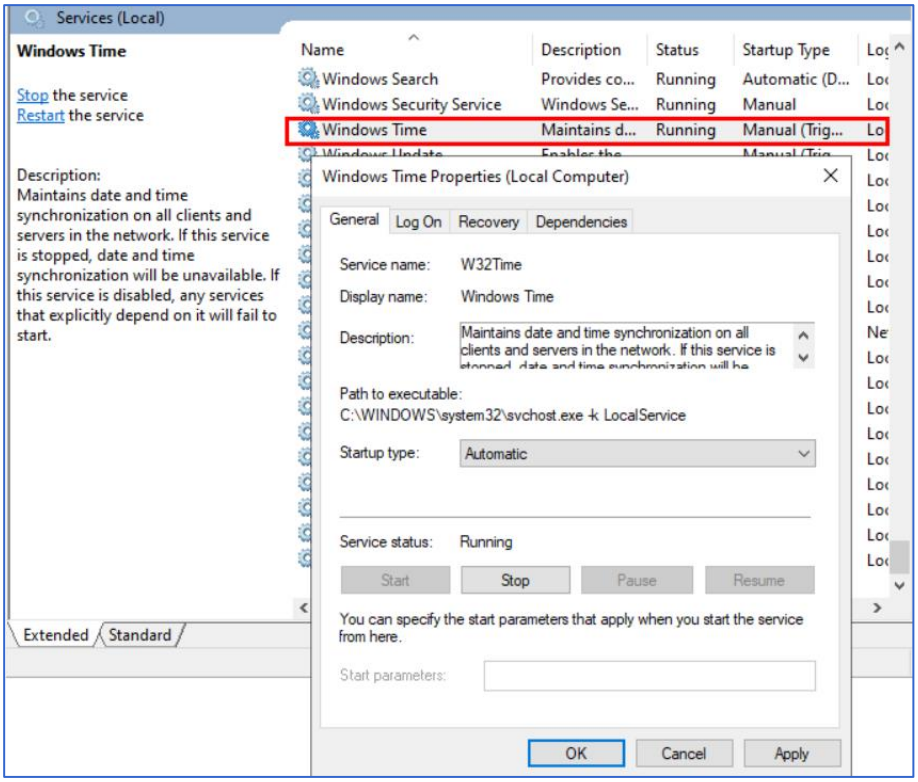
1. Start **File Explorer**, and go to **Control Panel\Administrative Tools**.



2. Double-click **Services**.



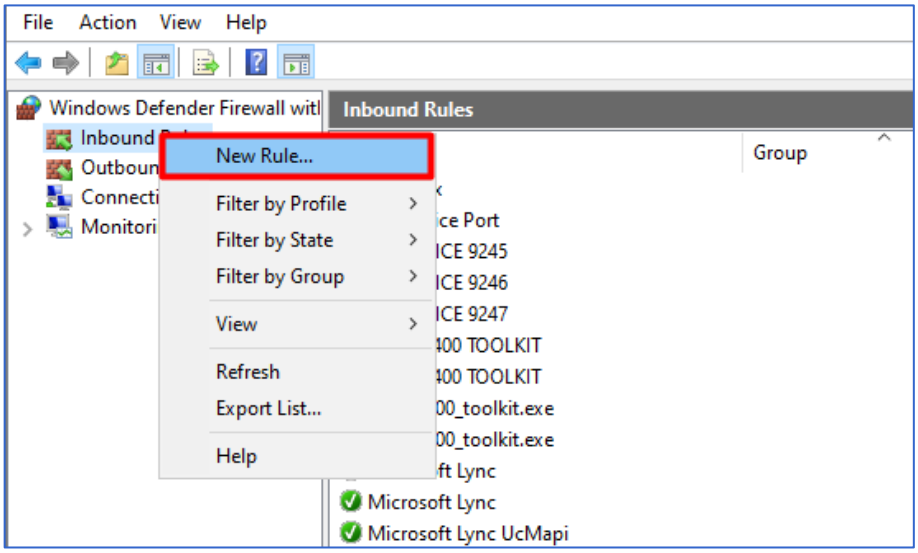
3. On the Services list, right-click **Windows Time** > **Properties** and configure the following settings, and click **OK**.
   - **Startup type**: Automatic
   - **Service Status**: Start/Running



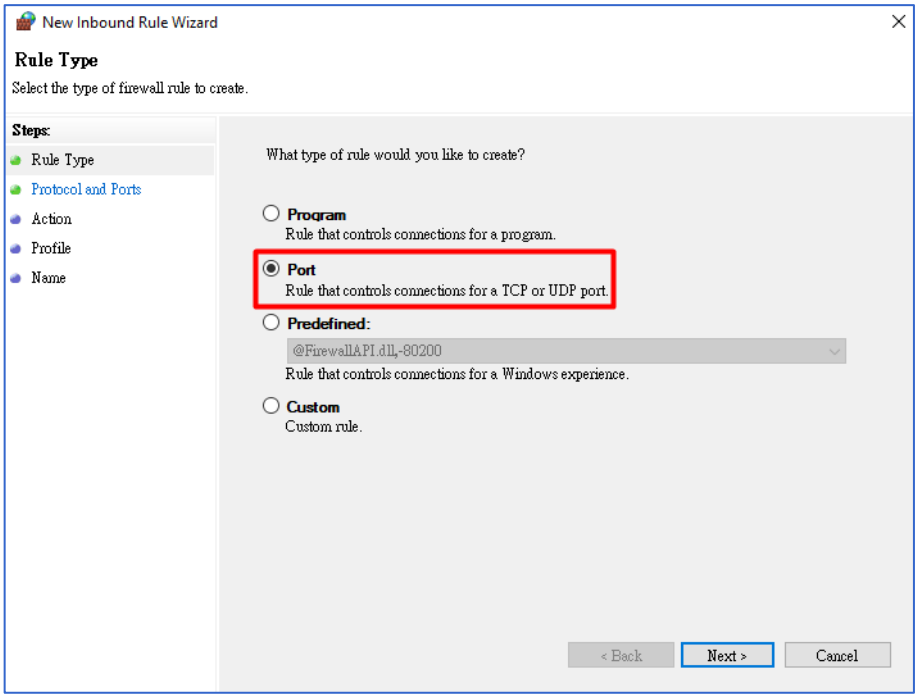
[Create firewall rules to allow inbound network traffic ONLY for a specified UDP port number]

1. Start File Explorer, and go to **Control Panel\Windows Defender Firewal\Advanced setting**.

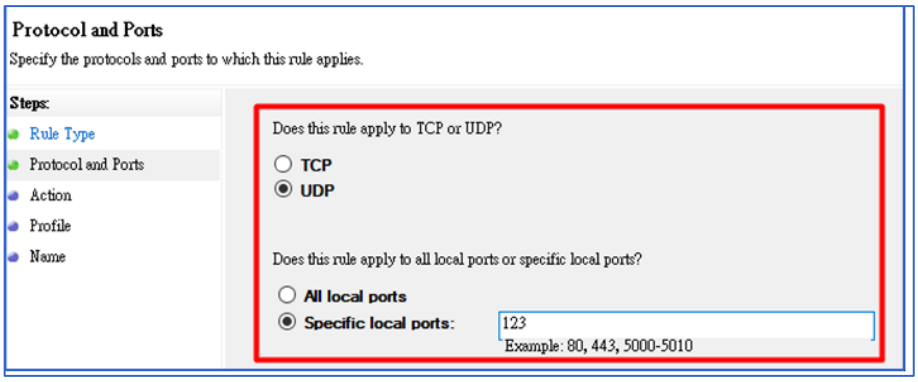
2. On the left menu, **Inbound Rules > Action > New rule**.



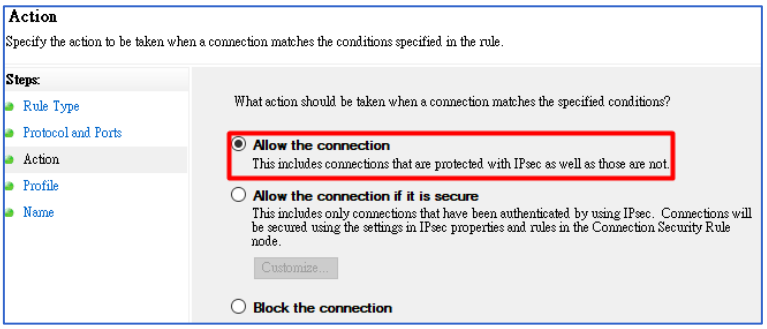
3. On the left menu, select **Rule Type** > **New Inbound Rule Wizard** > **Port**, and click **Next**.



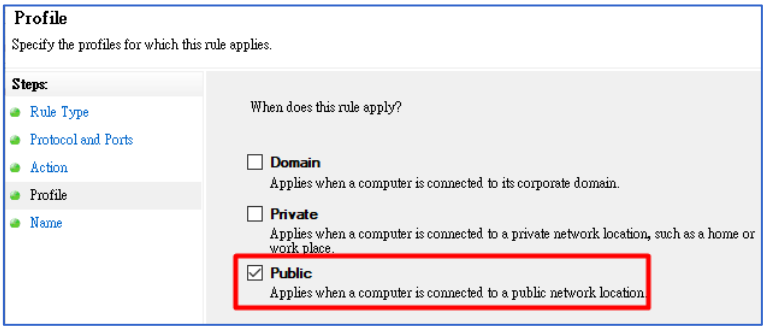
4. In **Protocols and Ports**, specify the following parameters and click **Next**:
   - **Does this rule apply to TCP or UDP**: UDP
   - **Specified local porsport number:** 123



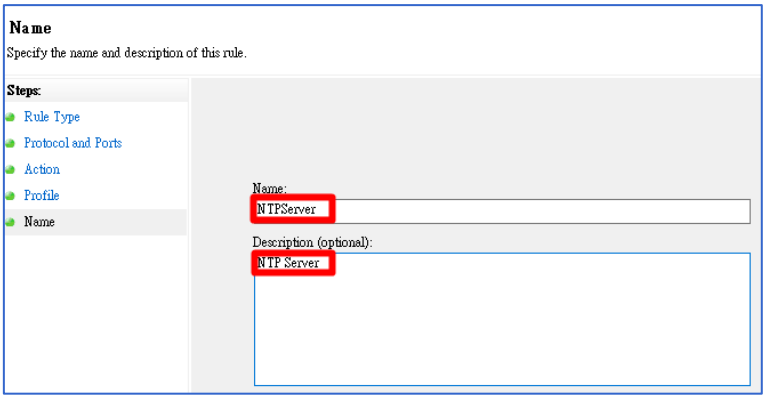
5. In **Action**, select **Allow the connection** and click **Next**.



6. In **Profile**, select **Public** and click **Next**.



7. In **Name**, type the following paramters and click **Finish**:
   - **Name**: The name for the inbound rules, i.e. NTPServer
   - **Description**: The description for the rule.

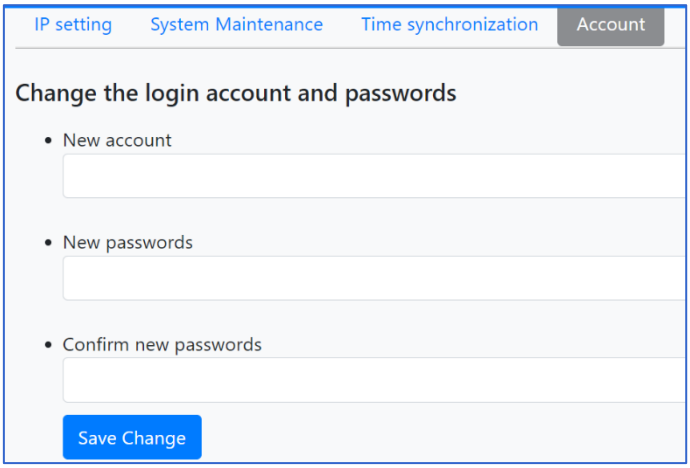


The local NTP settings are now completed.

d. Account & Password

This tab provides management of user's account name and passwords. Type new account name / password in the related field and click **Save Changes** to change the default account name / password.

Change user name and password to access this web interface.



Note: Once the account name / password is renewed, the default account name / password cease working. If the renewed account name / password is lost, logging onto the camera's web interface becomes impossible. In that case, refer to *Chapter1 1.2-C* to restore the camera to factory default.

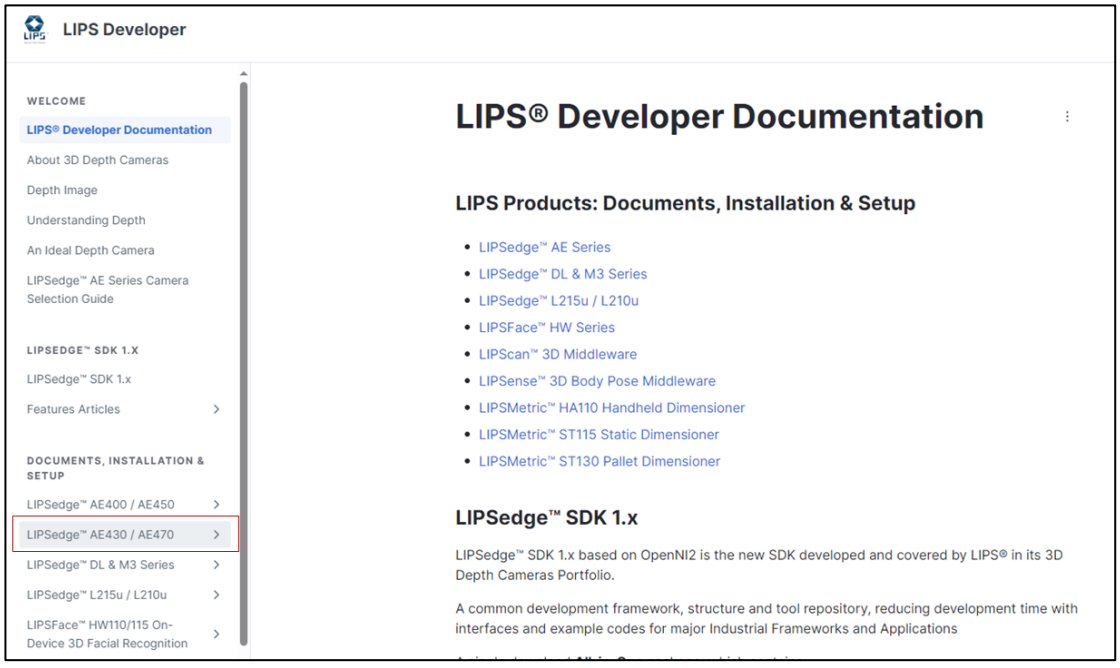
---

e. Firmware Update

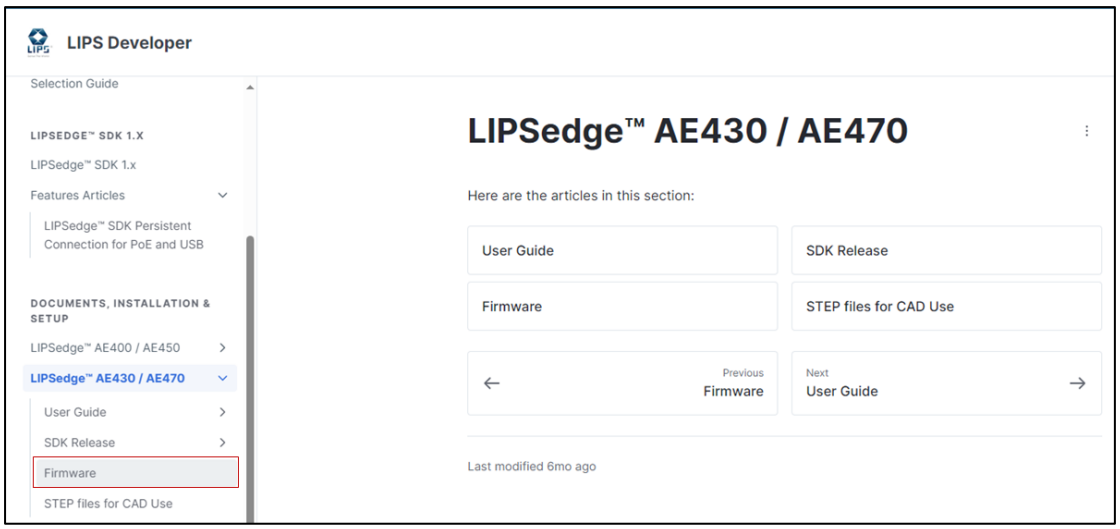
This tab allows for updating the camera's firmware, which is periodically released on LIPS Corp.'s official website. Specific versions of LIPSedge™ AE430 / AE470 SDK works best with compatible firmware versions.

The updating process takes approximately 7 ~ 9 minutes, depending on the host's network condition. While updating firmware, **ensure the power supply is constant** throughout the process. The updating process is an advanced configuration; failure to comply with the instructions below may cause the camera to become unusable. In that case, send the camera back to LIPS Corp. for customer service.

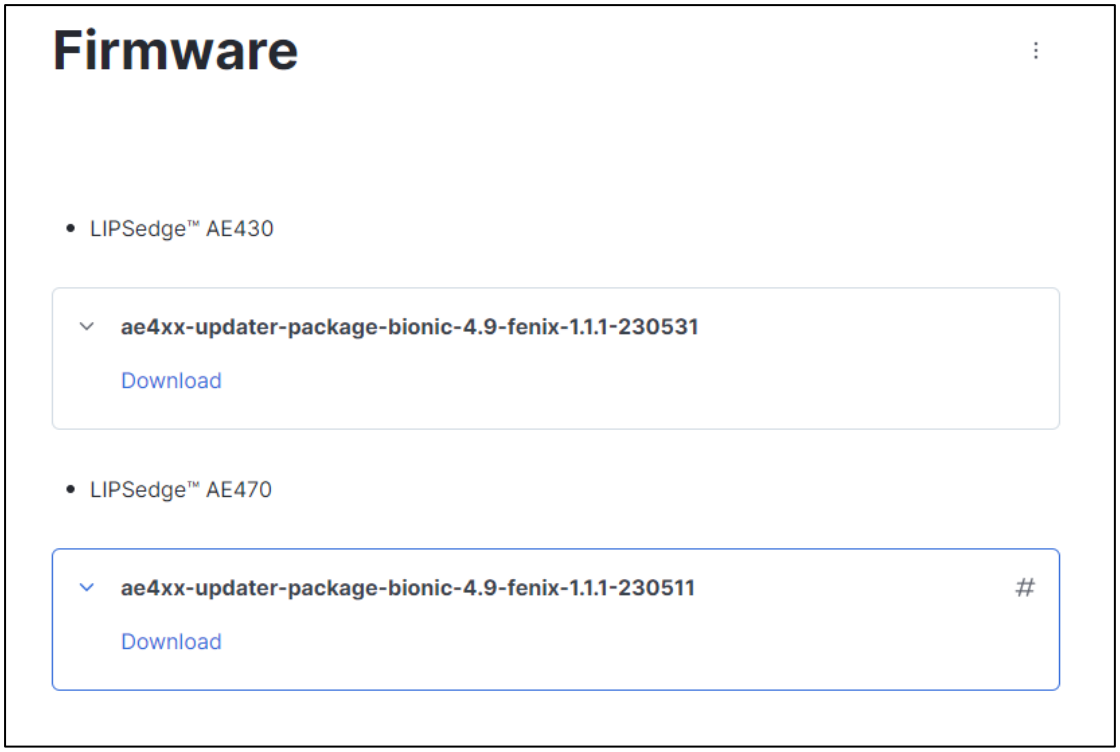
1. Go to [3D Camera/Software Developer Documentation, Code Samples | LIPS Corporation (lips-hci.com)](). On the left bar, select **LIPSedge™ AE430 / AE470**.



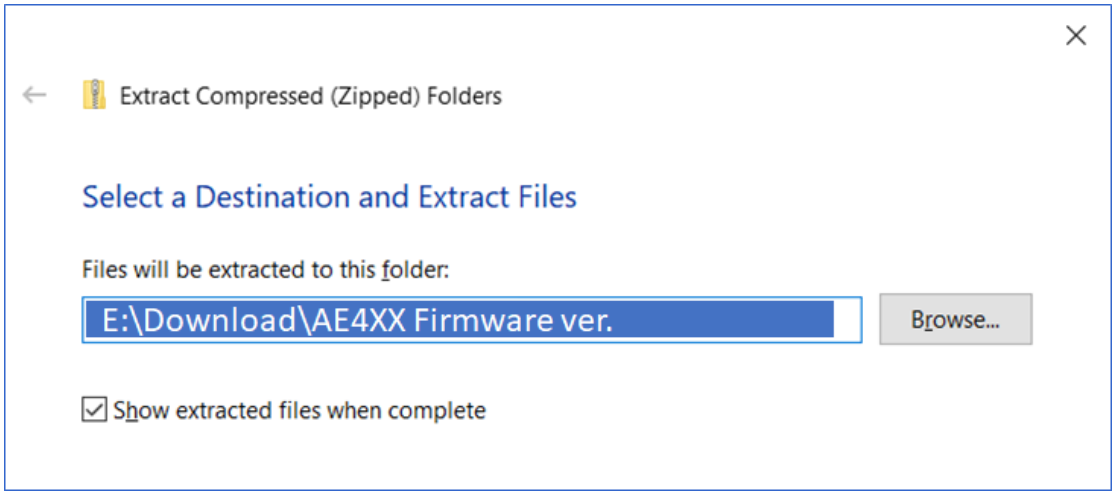
2. Click **Firmware** under LIPSedge™ AE430 / AE470 layer.



3. Select the firmware according to the SDK version and click to download. Here, Firmware V1.1.1-230531 is used as an example for AE430.

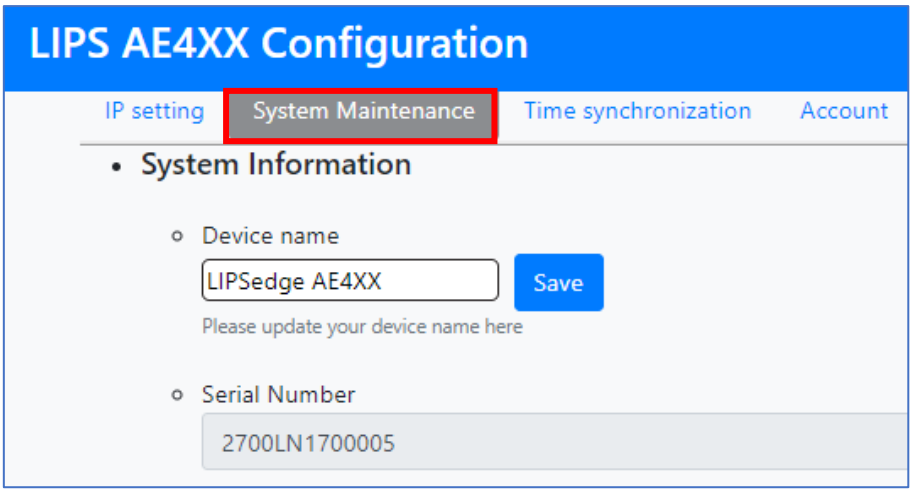


4. Extract the downloaded file.

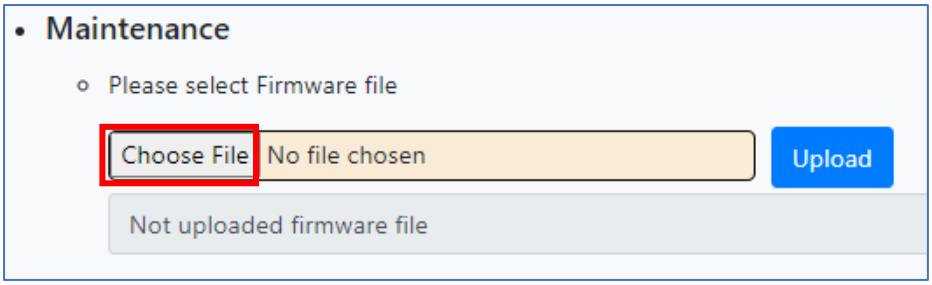


5. Log onto the camera's web interface. For details, refer to *Chapter3 3.2-C*.

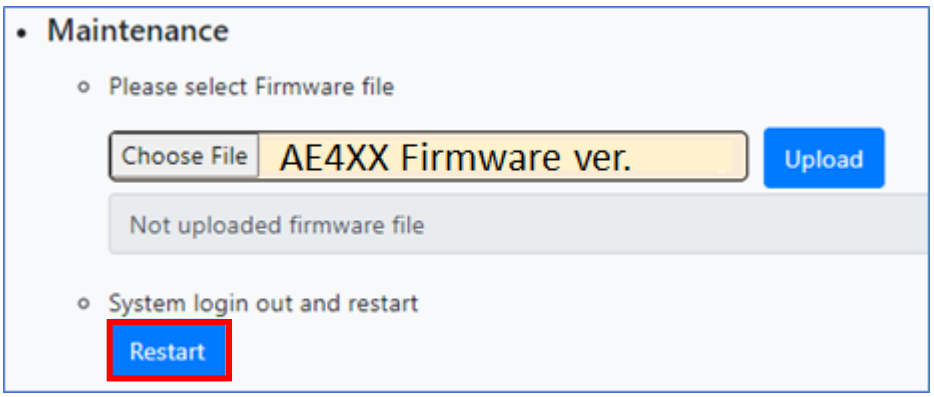
6. From the top bar, select **System Maintenance**.



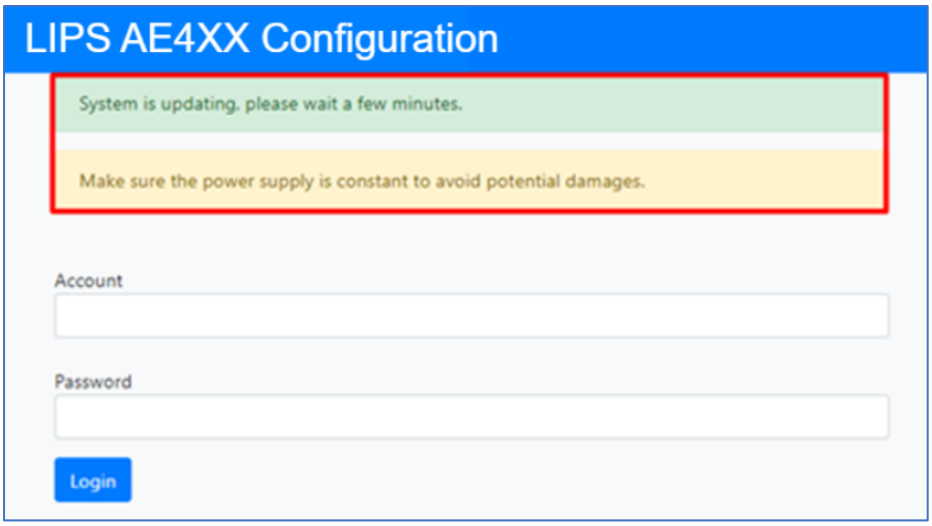
7. Scroll to the **Maintenance** section and select the downloaded firmware from your PC / laptop.



8. Click **Restart**.



9. The system logs out to start the updating process. The process takes about 8 minutes.

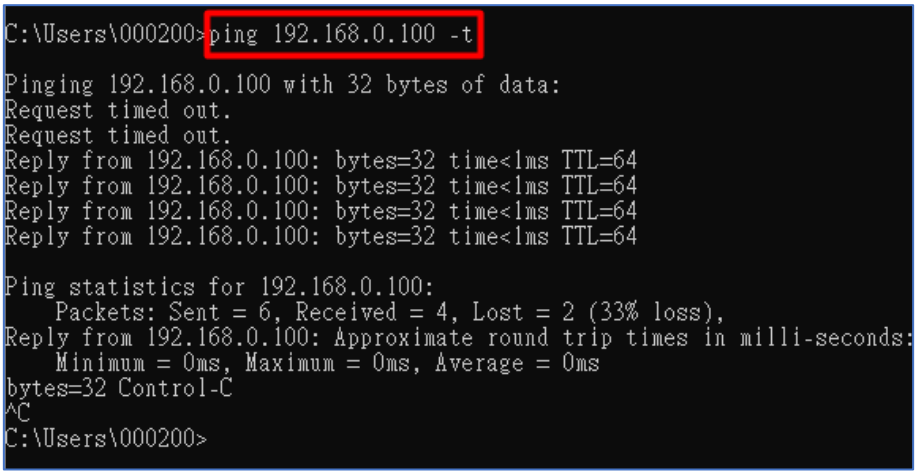


WARNING: Power interruption during the updating process damages the camera. During the 8-minute updating period, make sure the power supply is constant to avoid potential damage. If damages occur to the camera, contact info@lips-hci.com.

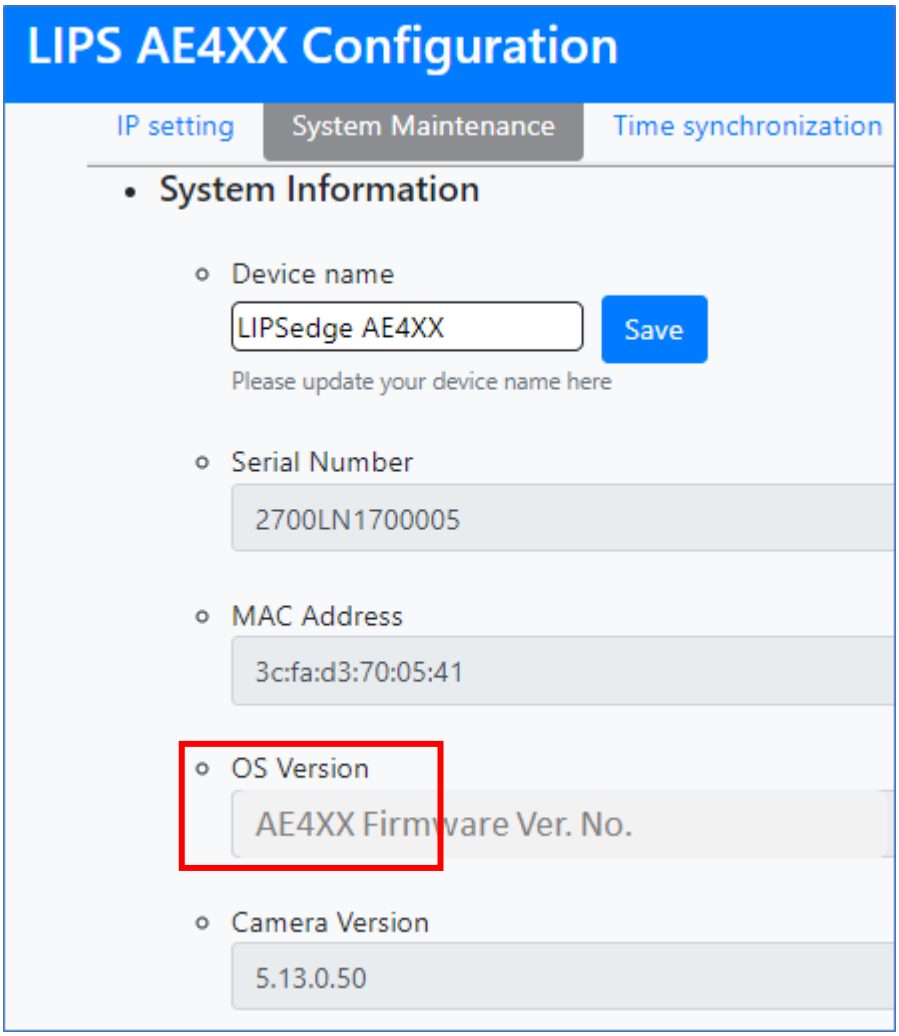
---

10. To verify the update, start the **Command Prompt**. Type the following command and wait until the camera responds. Response after a few time-out requests indicate the update was successful.

```
ping [Default IP Address] -t
```



11. Log onto the Web Interface of LIPSedge™ AE4XX camera. Under System Maintenance, you can see the firmware version if it is successfully updated.

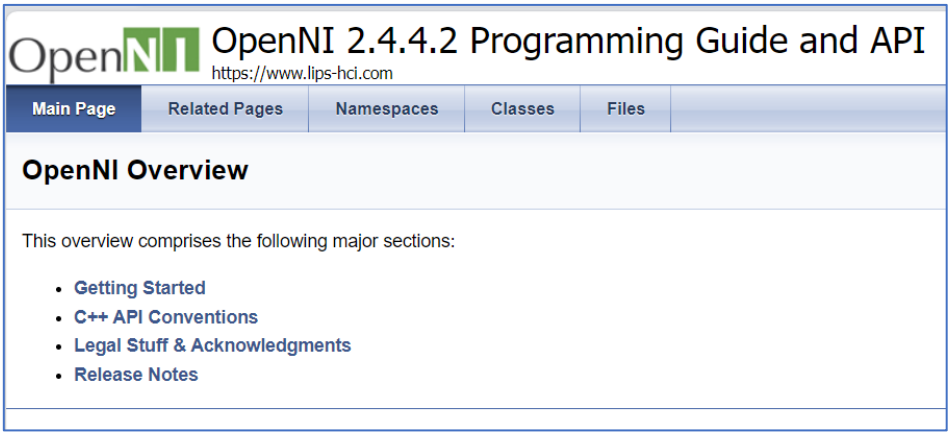


Note: If the LIPSedge™ AE430 / AE470's IP address has been changed, the camera's IP address will be **restored to the default IP address** of **192.168.0.100**. Avoid using the default IP address for other cameras in multiple connection cases as the update process can cause IP address conflict. Make sure the host PC / laptop is under the same subnet as your camera for camera connection.

---

4. APIs

LIPSedge™ AE430 / AE470 SDK is integrated with OpenNI APIs. The key strength of this robust framework lies in its effortless access to the camera's internal parameters, empowering developers to delve deep into raw data and tailor applications to specific functionalities. Developers can access the programming guide for the API at: /LIPSedge[Model]-SDK/Documentation.

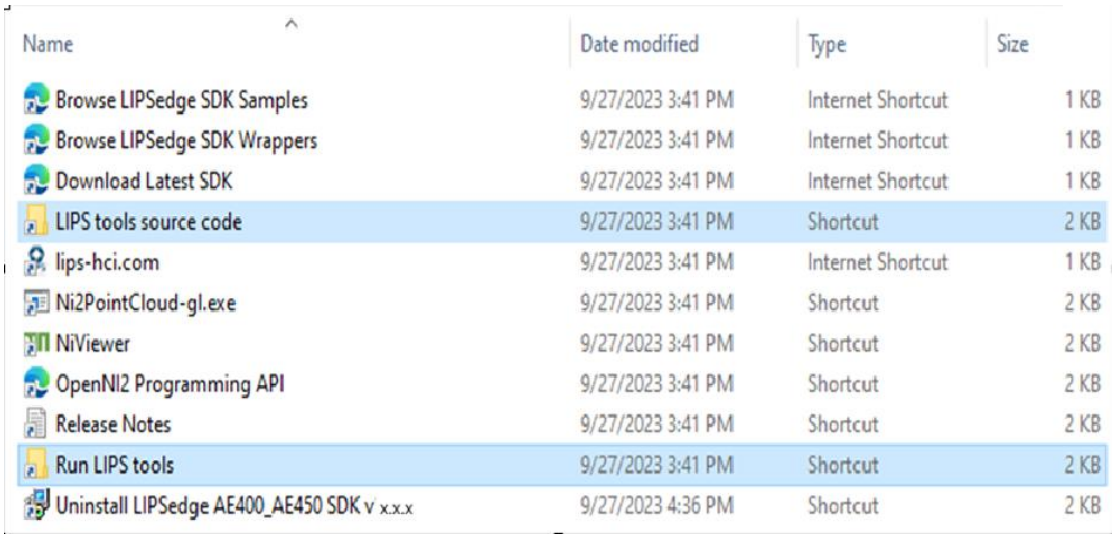


1. Main Page: This tab provides a clear overview of the OpenNI API, including a quick installation guide, introduction of the coding conventions, legal documents, and the release notes.
2. Related Pages: This tab provides a selection of the information that is related to OpenNI.
3. Namespaces: This tab provides users with a hierarchical structure of namespaces that categorize the specific functionalities of the API.
4. Classes: This tab dives deeper into each individual class within the OpenNI API, outlining its properties and methods to enable developers to fully understand and utilize each element.
5. Files: This tab provides a description of the source code files that make up the OpenNI API.

5. Tools

LIPSedge™ AE430 / AE470 SDK provides a series of executable tools and their source code essential for visualization, data capture, camera parameters acquisition et cetera to facilitate the development of applications and solutions for LIPSedge™ AE430 / AE470 cameras. These tools and their system components are placed in the following folder:

- Run LIPS tools Source code: Contains a series of executable tools; users can refer to Chapter 5.1 Samples codes for reference.
- LIPS tools source code: Contains a series of the source code of these tools. Users can refer to Chapter 5.2 Compilation. These codes can also be downloaded from the link below for the latest updates: https://github.com/lips-hci/LIPSedge-sdk-samples

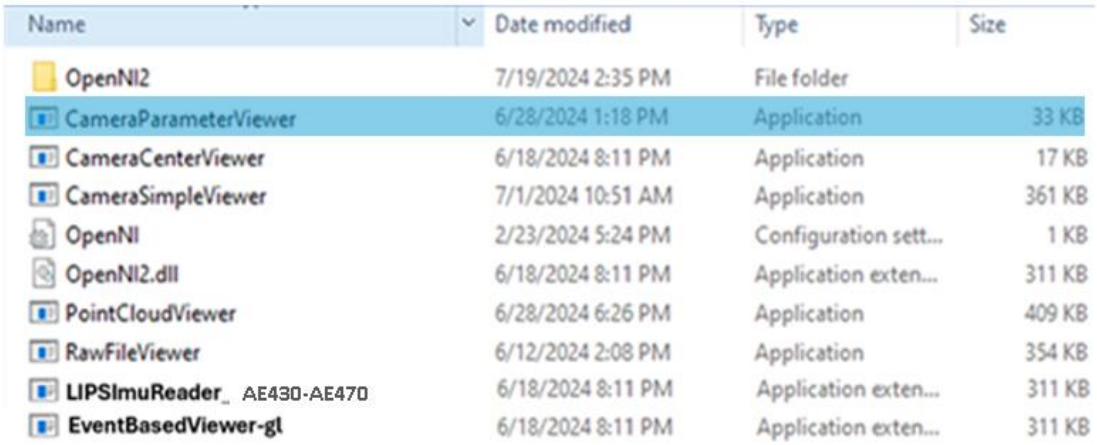


5.1 Sample codes

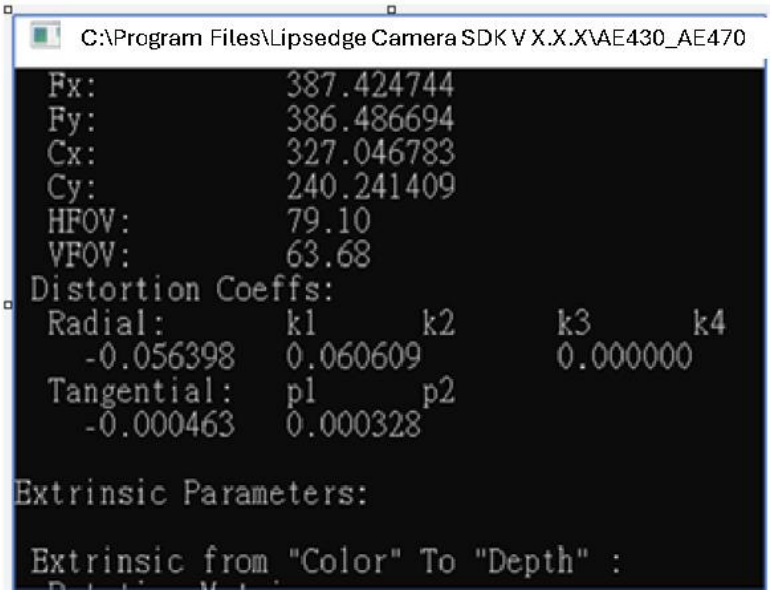
A. CameraParameterViewer

A simple OpenNI2 tool to query supported video modes and list camera intrinsic/extrinsic parameters.

1. In **Bin**, click **CameraParameterViewer.exe**.



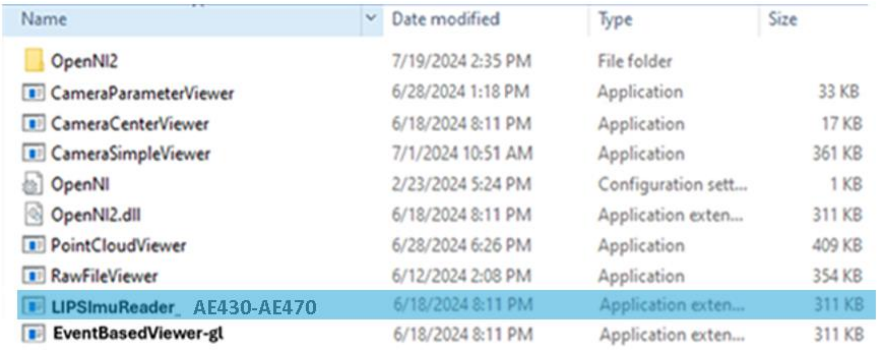
2. Provides detailed camera parameters for depth, IR, and color cameras.



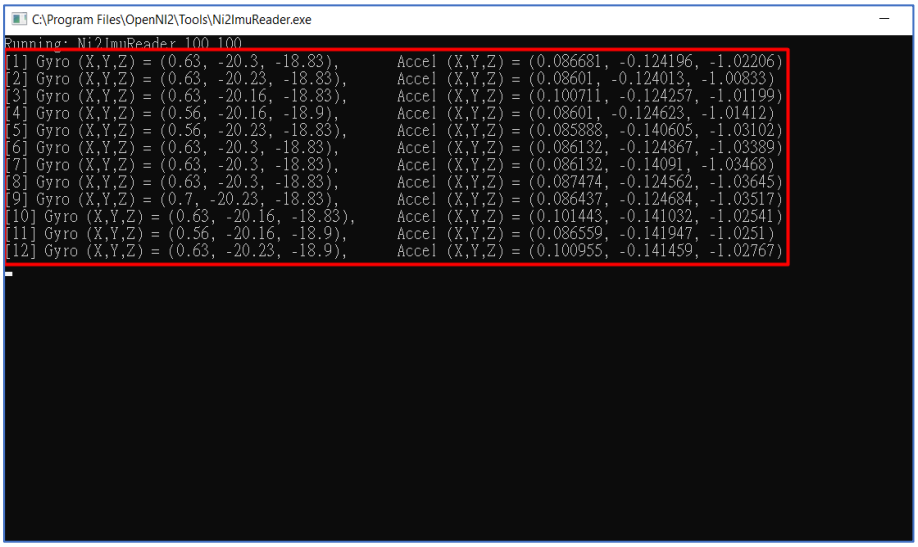
B. LIPSImuReader (Coming Soon)

A simple OpenNI2 console program to show depth value at center point of frame.

1. In **Bin**, click **Ni2ImuReader.exe.**



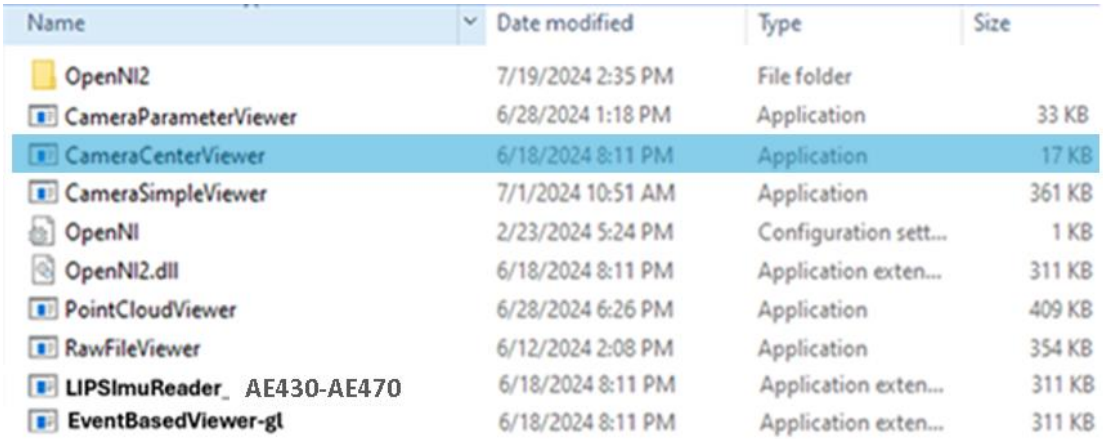
2. A window containing 100 frames of IMU detection results pops up.



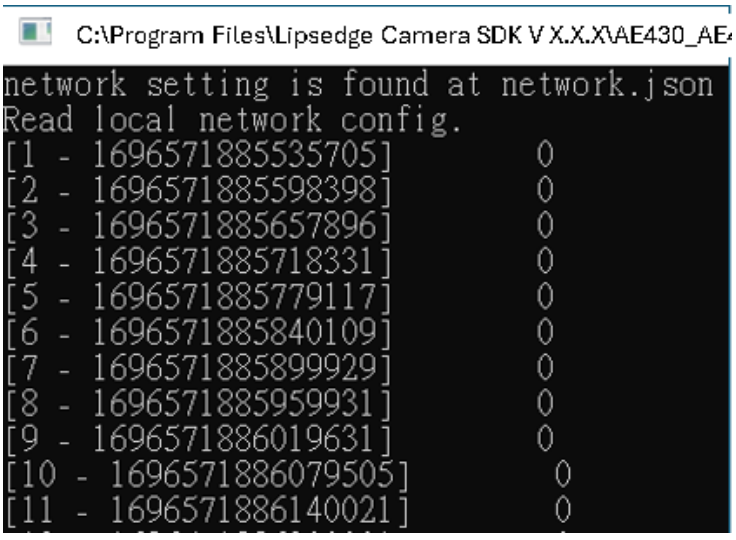
C. CameraCenterViewer

A simple OpenNI2 console program to show depth value at the center point of the frame.

3. In **Bin**, click **CameraCenterViewer.exe.**



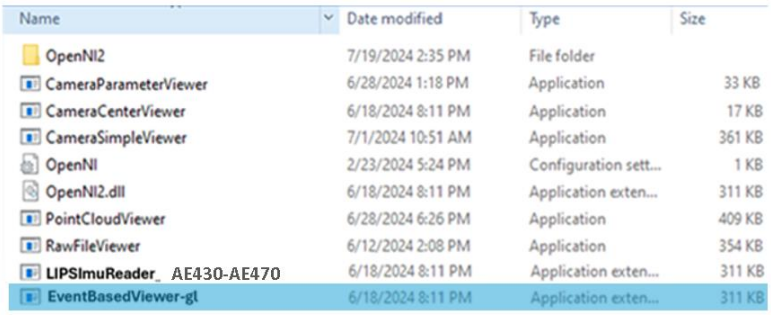
4. A simple OpenNI2 console program to show depth value at the center point of the frame.



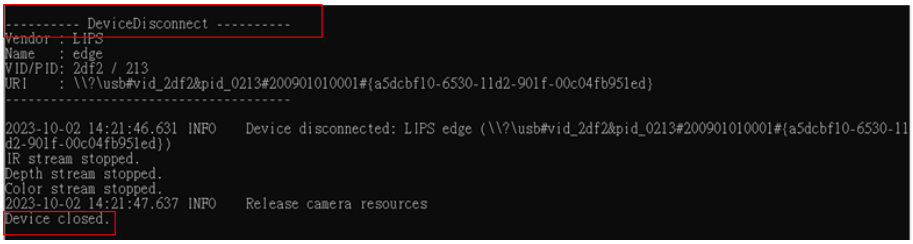
D. EventBasedViewer-gl (Conming soon)

OpenNI2 device management by event-driven design.

1. In **Bin**, click **EventBasedViewer.exe.**



2. The Ni2EventBasedViewer-gl provides notifications when the device becomes disconnected.

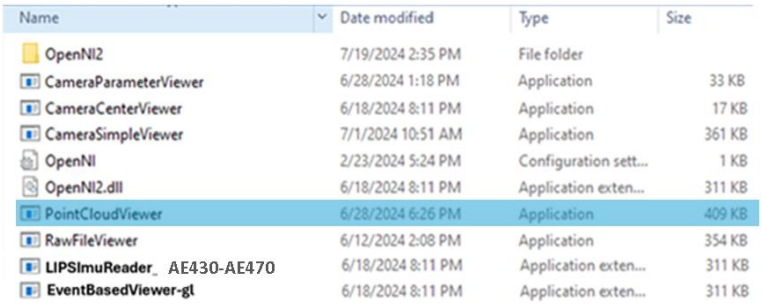


3. When users reconnect the device, the system promptly re-establishes the connection, granting access to streaming for Depth, IR, and RGB data.

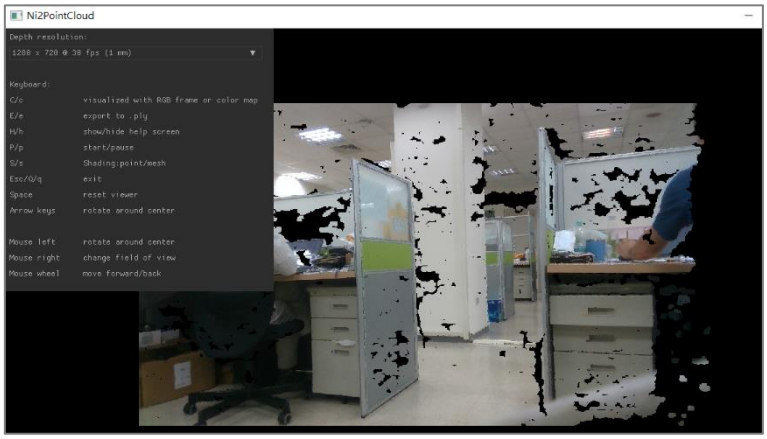
E. PointCloudViewer

A tool for 3D point cloud visualization through OpenGL.

1. In **Bin**, start **PointCloudViewer.**

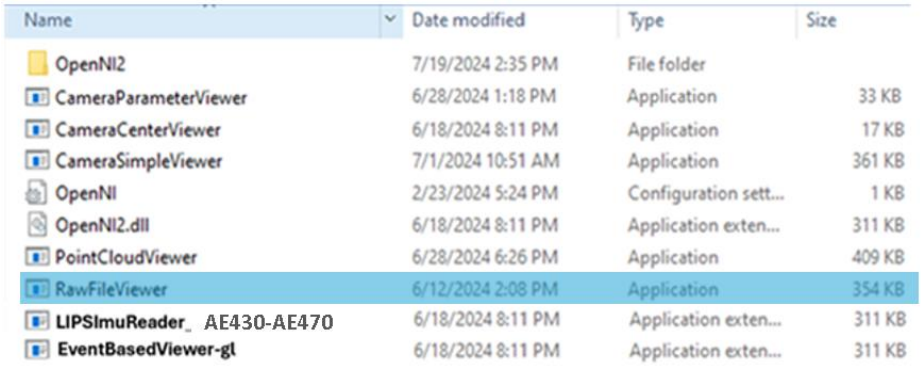


2. Another OpenNI2 sample for 3D point cloud visualization through OpenGL.



F. RawfileViewer

A tool for reading OpenNI2 frames captured in raw data format. To achieve this:

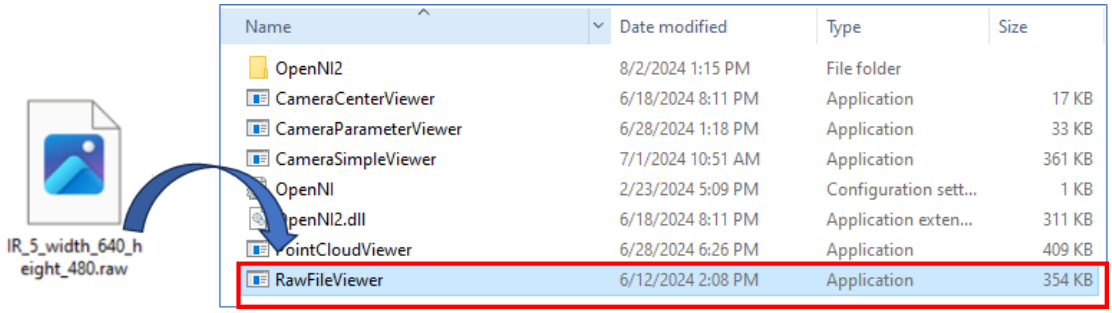


1. Start DepthViewer. Make sure the camera is properly configured and connected.

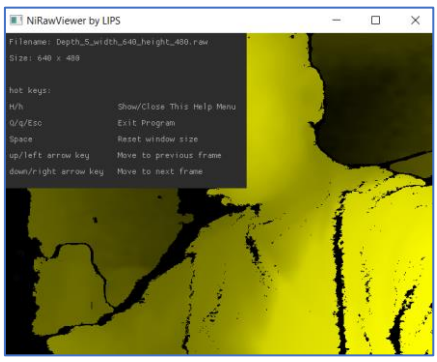
2. Press C, and the current image will be captured.

3. Go to **LIPSedge™ AE430_AE470 SDK > OpenNI2 > Tools**

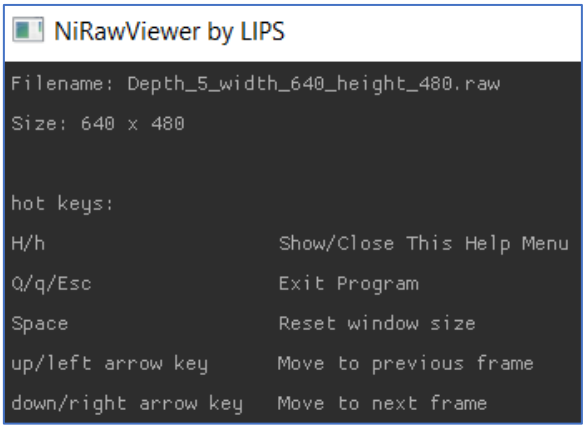
4. Drag a raw image file to the RawFileViewer.



5. The raw image file will be displayed.



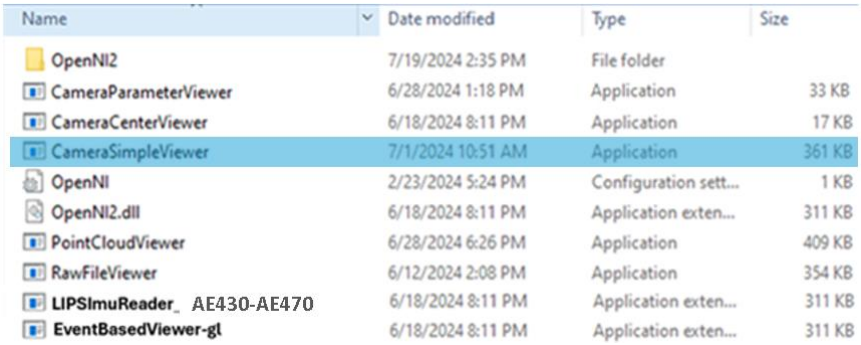
6. Users can navigate through the image with the following hotkeys:
   - H / h: Displays / turn off the help menu.
   - Q / q / Esc: Exit NiRawViewer-gl.
   - Space: Reset adjusted window size to its original resolution.
   - Up / Left arrow key: Displays the previous frame.
   - Down / Right arrow key: Displays the next frame.



G. CameraSimpleViewer

A simplified version of DepthViewer using OpenCV to display Depth/IR/Color frames.

1. In **Bin**, start **CameraSimpleViewer.exe**



2. A simplified version of DepthViewer using OpenCV to display Depth/IR/Color frames.

5.2 Compilation

Examples application's source code: The source code of the executable tools in LIPSedgeSamples. Refer to *Chapter5 5.1*. In cases where the source code is corrupted, LIPS Corp. provides the source code on LIPS Corp.'s GitHub.

Application name	Source code
LIPSCameraMatrix	LIPSedge-sdk-samples/LIPSCameraMatrix at main · lips-hci/LIPSedge-sdk-samples · GitHub
LIPSImuReader	LIPSedge-sdk-samples/LIPSImuReader at main · lips-hci/LIPSedge-sdk-samples · GitHub
Ni2CenterRead	LIPSedge-sdk-samples/Ni2CenterRead at main · lips-hci/LIPSedge-sdk-samples · GitHub
Ni2EventBasedViewer-gl	LIPSedge-sdk-samples/Ni2EventBasedViewer-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub
Ni2PointCloid-gl	LIPSedge-sdk-samples/Ni2PointCloud-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub
Ni2RawViewer-gl:	LIPSedge-sdk-samples/Ni2RawViewer-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub
Ni2SimpleViewer-cv	LIPSedge-sdk-samples/Ni2SimpleViewer-cv at main · lips-hci/LIPSedge-sdk-samples · GitHub
Ni2SimpleViewer-gl:	LIPSedge-sdk-samples/Ni2SimpleViewer-gl at main · lips-hci/LIPSedge-sdk-samples · GitHub

6. Supported Language & Wrappers

LIPSedge™ AE430 / AE470 SDK (OpenNI-based) supports various programming Languages/ Libraries/ Frameworks to enhance the development project. These programming language-based SDK and libraries/ frameworks are available at LIPS-HCI · GitHub.

Type	Name	Description	GitHub Link
Language	Python3	Support Python3	python3 · GitHub
	.NET	Support for .NET languages with examples in C#	.NET GitHub
	C#	Support C#	Coming Soon.
	Java	Support Java	Coming Soon.
Library	OpenCV	Integration with OpenCV computer-vision library	OpenCV GitHub
	PCL	Integration with Point Cloud Library	Coming Soon.
Framework	ROS	Integration with Robot Operating System (ROS)	Coming Soon.
	ROS2	Integration with Robot Operating System 2 (ROS 2)	Coming Soon.
	ISAAC	Support NV Isaac robot platform as depth camera data provider	Coming Soon.
	Halcon	Integration with HALCON development environment	Coming Soon.

7. Application & Middleware Supports

In addition to the LIPSedge™ AE430 / AE470, LIPS Corp. also offers a diverse range of advanced 3D cameras and comprehensive solutions that cater to various imaging and sensing requirements. For details, refer to the following chapter:

7.1 Applications

LIPS Corp. offers a wide range of advanced 3D camera kits. These offerings encompass various technologies to cater to diverse imaging and sensing requirements. For details, refer to. https://www.lips-hci.com/.

- LIPSMetric™
- LIPSense™

7.2 Middleware

LIPS Corp. offers exclusive middleware solutions. These solutions encompass various technologies to cater to diverse imaging and sensing requirements. For details, refer to. https://www.lips-hci.com/.

- LIPSMetric™
- LIPSense™

8. SDK Tutorial

LIPS Corp. provides extensive support for a variety of SDKs. LIPS Corp.'s GitBook tutorial offers practical examples and applications with hands-on guidance based on the following platforms:

Name	Description
C++	https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview
Python	https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-1
Java	https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-2
OpenCV	https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-3
GenICam	https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/genicam
ROS	https://lips-hci.gitbook.io/lips-developer-documentation/sdk-code-samples-and-languages-wrappers/openni2/overview-4

9. Appendix

9.1 Regulatory Compliance Notice

FCC Compliance

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Label Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

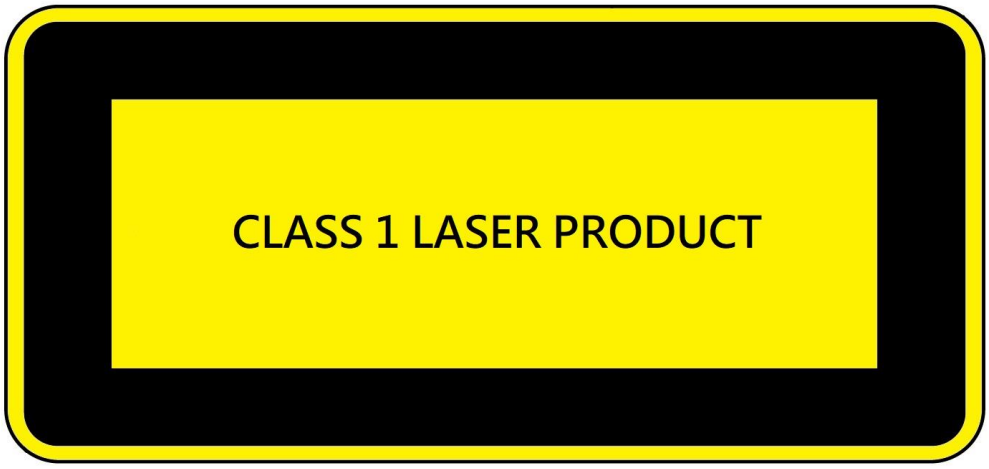
(2) this device must accept any interference received, including interference that may cause undesired operation.

IEC/ EN 60825 + FDA Laser Safety

CLASS 1 LASER PRODUCT

COSUMER LASER PRODUCT

EN 50689:2021



This device complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

CE Compliance

Warning:

This is a class A product. In a domestic environment this product may cause radio interference in
which case the user may be required to take adequate measures.

RoHS Compliance

All lead-free products offered by the company comply with the requirements of the European law on the Restriction of Hazardous Substances (RoHS) directive, which means our manufacture processes and products are strictly “lead-free” and without the hazardous substances cited in the directive.

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